

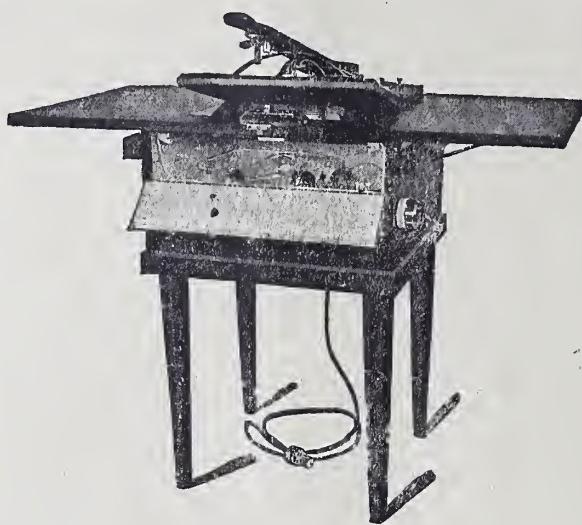
Vol. 57. No. 5

May 1920

20 Cents

The
Photographic
Journal
of America

Published Monthly
With Illustrations



Efficiency in the Printing Room

can never be obtained with make-shift or antiquated equipment. A reliable, scientifically correct, modern printing machine is essential in the production of work of highest quality.

The Ansco 11 x 14 Professional Printing Machine is designed for general use. It is easy to install, economical to maintain and uniformly dependable as to light.

PRICES and full description of this Printer
and other Ansco professional apparatus for
photographic studios will be mailed on request.

ANSCO COMPANY BINGHAMTON, N. Y.

NEW YORK
129-131 West 22nd St.

SAN FRANCISCO
171-173 Second St.

CHICAGO
308 N. Michigan Blvd.

TORONTO
347 Adelaide St., W.



It's the film
that makes
the picture



No matter how beautiful the scene, how expensive the lens, how efficient the shutter, unless your film is *right*, complete success in taking pictures cannot be attained.

AnSCO Speedex Film

excels in recording pictures faithfully and as rapidly as is demanded, at all seasons and in all climes.

It is the original and the perfect film. Adapted for use in any roll film camera.

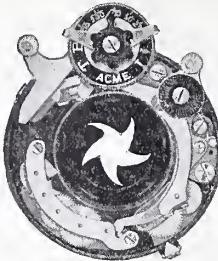
Write for AnSCO Speedex Film Booklet

AnSCO Company

Binghamton, N. Y.

THE MOST
ADVANCED
TYPE OF
SHUTTER

"Use an Ilex and avoid shutter trouble." Write today for our free catalog



IN THE
PHOTOGRAPHIC
WORLD

Showing the Famous Ilex Gear Combination for governing the slower and higher speeds

ILEX OPTICAL COMPANY, 781 Ilex Circle, ROCHESTER, N. Y.

Paget Self Toning Papers

Easy to Work—Beautiful Results

Send for Sample Print

Platinotype, sepia and black.

Palladiotype, sepia and black.

Satista, black only—splendid for water colors.
Prints lie flat.

We are sole American agents for the Paget Prize Plate Company, Ltd., and the Platinotype Company

WILLIS & CLEMENTS
PHILADELPHIA, PA.

Wallace's "Metol"

Is a pure Mono Methyl Paramido Phenol Sulphate. Better than best imported

We are Actual Manufacturers—Not Mixers

On request we will send complimentary sample to professional photographers

Send Us the Name of Your Dealer

Special Materials Company, Inc.

Manufacturing Chemists

140 Livingston St., Brooklyn, N. Y., U. S. A.

Important to Photographers

ARTOGRAPH

TRADE MARK

SCREEN

Pat. Pending

The Latest and Greatest Labor Saving Device.

Thousands of skilled photographers lack time for retouching of negatives.
Thousands of others lack skill.

THE ARTOGRAPH SCREEN BLENDS THE HIGHLIGHTS INTO THE SHADOWS WITH A STIPPLED EFFECT AND TAKES THE PLACE OF THE EXPERT RETOUCHER.

NO TIME NO SKILL REQUIRED

SEND FOR ONE TO-DAY

Endorsed by SARONY and Other HIGH CLASS PHOTOGRAPHERS
Sent on receipt of price 5x7 inch \$3.50 8x10 inch \$5.00

The Artograph Screen Co.
500 FIFTH AVENUE NEW YORK
FOR SAMPLE PHOTO SEND 15¢ IN STAMPS

THE BOOK YOU NEED

How to Make a Studio Pay

By FRANK FARRINGTON

With Introduction by Ryland Phillips

Price, \$1.50, Cloth, net

EDWARD L. WILSON CO., Inc.

122 East 25th Street, New York

Pictures
Mounted
with
HIGGINS'
PHOTO
MOUNTER



Have an excellence peculiarly their own. The best results are only produced by the best methods and means—the best results in Photograph, Poster and other mounting can only be attained by using the best mounting paste—

HIGGINS' PHOTO MOUNTER
(Excellent novel brush with each jar.)

At Dealers in Photo Supplies,
Artists' Materials and Stationery.

A 8-oz. jar prepaid by mail for 30c., or circulars 25c., from
CHAS. M. HIGGINS & CO., MFRS.
NEW YORK, CHICAGO, LONDON.

Main Office, 271 Ninth Street, Brooklyn, N. Y.,
Factory, 246-248 Eighth Street, U. S. A.

THE PHOTOGRAPHIC JOURNAL *of* AMERICA

REGISTERED IN THE UNITED STATES PATENT OFFICE

NEW SERIES: WILSON'S PHOTOGRAPHIC MAGAZINE

***AN ILLUSTRATED MONTHLY DEVOTED TO THE SCIENCE
AND ART OF PHOTOGRAPHY***

THE OLDEST PHOTOGRAPHIC MAGAZINE IN AMERICA

Founded 1864

Incorporating:

The Philadelphia Photographer

The Photographic World

THOMAS COKE WATKINS, Editor

CONTENTS FOR MAY, 1920

Arrangement of the Group	James Watt	171
The Perspective and Values of a Photographic Business		174
Thoughts on Style	F. C. Tilney	176
Some Considerations of Straight Photography and Control	Anthony Guest	179
Editor's Table—To Our Readers—Posing Men		183
The Studio—Practical Papers on Studio Work and Methods		184
Abstracts and Translations	E. J. Wall, F.R.P.S.	187
Views and Reviews		189
The Workroom		192

YEARLY SUBSCRIPTION, in advance, postage paid, United States, Mexico, Cuba,
Philippines and Porto Rico, \$2.00; Canada, \$2.35. Countries in the Postal Union, \$2.75.
Single copies, 20 cents.

REMITTANCES may be made at our risk by money order, check, draft, or registered letter.
SUBSCRIPTIONS begin with current issue.

Published by EDWARD L. WILSON COMPANY, INC.,

THOS. C. WATKINS, President.

701 Arch Street, Philadelphia, Pa.

EXECUTIVE and EDITORIAL OFFICES, CAMERA BUILDING, 122 EAST 25th ST., NEW YORK CITY
HOUGHTON'S, Ltd., London, Eng., Agents for Great Britain

American News Co., Distributors for U. S. Kodak Australasia Ltd., Sydney, Agents for Australia
RICHARD HILL, Devonport, Auckland, Agent for New Zealand

Entered at Philadelphia Post-office as Second-class Matter

This is one of a series of sketches on Leading American Photographers.

American Photographers

L. L. HIGGASON:—If you were asked to tell something about Asheville, N. C. you would probably say "Why, that's the place that Higgason comes from." Without doubt "Higg" is much better known among photographers than his home town. Why? Because he has the happy faculty of making people *live again* on paper.

In recognition of his ability to make good pictures, Mr. Higgason has been awarded various cups, certificates and honors. At the present time he is also secretary of the Middle Atlantic States Photographers' Association.

Good photography is mostly dependent on "the man behind the gun", although good equipment, intelligently selected, undoubtedly plays an important part. Higgason wisely uses a complete battery of Wollensak objectives, including a Velostigmat Series II F:4.5, Vitax F:3.8 and Verito Soft Focus F:4 and says he couldn't afford to be without one of them.

Our catalog shows some of Mr. Higgason's work and describes our complete line.

Your copy will be sent you free, on request.

The Velostigmat F:4.5, which was Mr. Higgason's first Wollensak lens, is here illustrated in barrel, but can be furnished in other mountings if desired. The Vitax and Verito complete Mr. Higgason's lens equipment.



WOLLENSAK OPTICAL CO. ROCHESTER, NEW YORK.



AMERICAN
MADE

REXOLON

DEVELOPING
AGENT

Rexolon is a new universal developing agent. Rexolon offers unusual, distinctive and important advantages over all other developing agents.

1. Rexolon is chemically pure and lasting.
2. Rexolon is distinctive for the non-oxidizing qualities. It will stand in an open solution twice as long as German metol.
3. Rexolon is non-poisonous to the skin, a characteristic which will appeal to all subject to metol poisoning.
4. Rexolon is a soft developer, greater contrast can be obtained by the addition of bromide, which within certain limits does not affect the tone.
5. Rexolon will produce good blacks and whites even if the negatives are under or over exposed.

Rexolon is being rapidly stocked by all photo dealers. It will pay you to give it a trial.
Put up in one, four and eight ounce bottles, also in one pound bottles.

One ounce bottle.....\$1.35

CHICAGO

Burke & James Inc.

NEW YORK

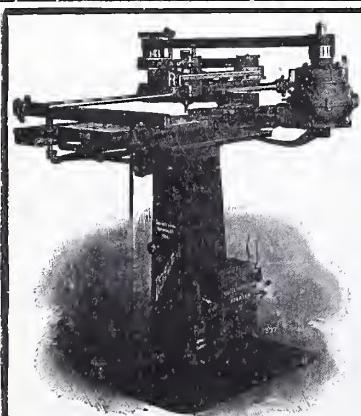


PLATE FINISHING

machines for the photo-engraver. Carefully and expertly constructed to give pleasing continuous service and the most practical advantages. Every operation provided for.

WRITE FOR PRINTED MATTER

JOHN ROYLE & SONS, PATERSON, N. J.
U. S. A.

Routers, Lining-Bevelers, Saws,
Trimmers, Router Cutters, Etc.

When writing to advertisers kindly mention this Magazine

ABE COHEN says:

**ICA CAMERAS
FILM PACK ADAPTERS
PLATE HOLDERS
CARL ZEISS LENSES
ALL SIZES**

Ready for Delivery NOW

Bebe	"A"	4½ x 6 cm	Zeiss-Tessar 4.5	\$100.00
Bebe		6½ x 9 cm	Zeiss-Tessar 4.5	130.00
Atom	"A"	4½ x 6 cm	Hekla 6.8	48.50
Atom	"A"	4½ x 6 cm	Zeiss-Tessar 6.3	73.50
Atom		4½ x 6 cm	Zeiss-Tessar 4.5	89.50
Ideal	"A"	6½ x 9 cm	Hekla 6.8	56.00
Ideal	"A"	6½ x 9 cm	Zeiss-Tessar 4.5	92.00
Ideal	"A"	6½ x 9 cm	Zeiss-Protar 6.3	118.50
Ideal	"A"	6½ x 9 cm	Zeiss-Amatar 6.8	89.00
Ideal	"A"	6½ x 9 cm	Zeiss-Icar 6.3	71.50
Ideal	"B"	9 x 12 cm	Hekla 6.8	70.00
Ideal	"B"	9 x 12 cm	Zeiss-Tessar 4.5	115.00
Ideal	"B"	9 x 12 cm	Zeiss-Protar 6.3	144.00
Ideal	"B"	9 x 12 cm	Zeiss-Amatar 6.8	109.00
Ideal	"B"	9 x 12 cm	Zeiss-Icar 6.3	88.00
Trix	"B"	10 x 15 cm	Hekla 6.8	67.50
Trix	"B"	10 x 15 cm	Zeiss-Tessar 4.5	134.00
Trix	"B"	10 x 15 cm	Zeiss-Protar 6.3	153.00
Trix	"B"	10 x 15 cm	Zeiss-Amatar 6.8	111.50
Trix	"B"	10 x 15 cm	Zeiss-Icar 6.3	88.00
Minimum-Palmos	6½ x 9 cm	Zeiss-Tessar 4.5	138.50	
Minimum-Palmos	9 x 12 cm	Zeiss-Tessar 4.5	160.00	
Icarette "A"	6 x 6 cm	Novar Anastigmat 6.8	30.00	
Icarette "A"	6 x 6 cm	Hekla 6.8	46.50	
Icarette "A"	6 x 6 cm	Zeiss-Tessar 4.7	72.50	
Icarette "A"	6 x 6 cm	Zeiss-Icar 6.3	57.50	
Icarette "C"	6 x 9 cm	Hekla 6.8	53.50	
Icarette "C"	6 x 9 cm	Zeiss-Tessar 4.5	89.50	
Icarette "C"	6 x 9 cm	Zeiss-Icar 6.3	67.50	
Halloh	3½ x 4½ cm	Hekla 6.8	60.00	
Halloh	3½ x 4½ cm	Zeiss-Tessar 6.3	92.00	
Halloh	3½ x 4½ cm	Zeiss-Icar 6.3	76.50	
Lloyd	8 x 14 cm	Hekla 6.8	75.00	
Lloyd	8 x 14 cm	Zeiss-Tessar 6.3	103.00	
Lloyd	8 x 14 cm	Zeiss-Icar 6.3	86.00	
Stereofix	45 x 107 mm	Novar-Anastigmat 6.8	61.50	
Polyscope	45 x 107 mm	Zeiss-Tessar 4.5	200.00	
Stereolette	45 x 107 mm	Hekla 6.8	86.00	
Stereolette	45 x 107 mm	Zeiss-Tessar 6.3	118.50	
Stereolette	45 x 107 mm	Zeiss-Tessar 4.5	141.50	

YOUR OLD CAMERA EXCHANGED

Abe Cohen's Exchange

*Largest retail dealer of Ica Cameras
in America*

114 Park Row

New York City



FILMS

For
3A Ansco 3A Rexo 3A Kodaks
Six Exposures— $3\frac{1}{4} \times 5\frac{1}{2}$

15c

30,000 rolls bought from the Air
Service of the U. S. Government

Regular price is - 55 cents

You save 40c on each roll
Postage 2c per roll

Stock up now!

WILLOUGHBY'S

**110 West 32d St. New York
Dept. E**

Make Natural Color Photos!

in your own plate camera with

**LUMIÈRE
Autochrom Plates**

You Can Reproduce

Golden Sunshine, Blue Sky, Brilliant
Flowers, Foilage, the TRUE colors of
hair, eyes or skin (bright or delicate
shades), and YOU can develop the
pictures yourself.

A SIMPLE PROCESS

We now have a complete stock

SEND FOR BOOKLET

**R. J. FITZSIMONS
75 Fifth Avenue, New York**

One of the best endorsements of a lens is the assurance that it is as good as a "GOERZ DAGOR." No lens is better known or has met more exacting practical tests than the famous GOERZ DAGOR F:6.8

Today it is more popular than ever. It is without question, one of the best all-around lenses ever made and it may be depended upon by amateur and professional photographers to *produce results*. The brilliancy, definition and covering-power of the GOERZ DAGOR is unsurpassed. Call at your dealers. Our lens booklet contains much practical information—send for it today.

GOERZ DAGOR F:6.8

C.P. GOERZ AMERICAN OPTICAL COMPANY
323 EAST 34TH STREET: NEW YORK CITY

"Money saved is money earned"

HAMMER PLATES

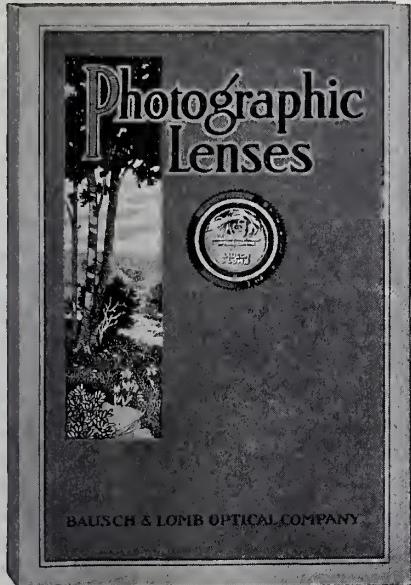
insure against needless loss. Purity of chemicals and perfection of manufacturing processes give them a speedy reliability and uniformity of excellence unapproached. Special brands for special needs.

Hammer's Special Extra Fast (red label) and Extra Fast (blue label) Plates for field and studio work and Hammer's Extra Fast Orthochromatic and D. C. Orthochromatic Plates for color-values



Hammer's Little Book, "A Short Talk on Negative Making," mailed free

HAMMER :: DRY-PLATE :: COMPANY
Ohio Avenue and Miami Street St. Louis, Missouri



WORK OF REFERENCE AND ART ALBUM

in one volume. That is what the new catalog of

Bausch & Lomb Anastigmat Lenses

amounts to. Just from the press, with new illustrations throughout, it will excite the admiration of all lovers of artistic printing and book-making.

It contains technical and practical information regarding photographic terms, optical properties of lenses, and advice (illustrated) as to lens equipment for the various types of photography.

Then there are complete descriptions, illustrations and latest prices of our famous Tessar Ic and IIb lenses for reflecting and hand cameras respectively, our Protar Convertible Series for all around photography and our Series IV and V for side angle work—also our new Process Anastigmat for both black and white and color work, presented here for the first time, our Telephoto attachment, and other accessories.

*Write for your copy of this
invaluable lens book today.*

BAUSCH & LOMB OPTICAL CO.

532 St. Paul Street

Rochester, N. Y.

New York Chicago San Francisco Washington

Leading American Makers of Photographic Lenses, Microscopes, Projection Apparatus (Balopticons), Ophthalmic Lenses, Stereopism Binoculars, Range Finders, Gun-Sights, Searchlight Projectors and other High-Grade Optical Products.

Established 1857

CHAS. COOPER & CO.

MANUFACTURING CHEMISTS

194 Worth Street, N. Y. City.

Works, NEWARK, N. J.

WE OFFER TO THE TRADE:

Acid Acetic
Acid Pyrogallic
Alum Chrome
Alum Powdered
Collodion Photo
Cooptol (in place of Metol)
Cotton Absorbent

Gold Chloride
Hydrochinone
Mercury Bichloride
Potassium Ferricyanide
Silver Nitrate
Sodium Carbonate
Sodium Hyposulphite
Sodium Sulphite, etc.



Send for Circular on How to Save Waste

NOTICE

To Our Readers

OWING to unsettled conditions and other difficulties, it is impossible to determine with any degree of accuracy when magazines will reach their destination, and your copy of the *Journal* may be a few days late in reaching you. Our mailing schedule has been adjusted and arranged, as best we can, to meet the unusual conditions now existing. We are making every effort to maintain prompt delivery, but if your copy of the *Journal* is not received by you, or on sale in the accustomed places at the usual time, you will at least know the reason why.

The *Journal* is published the first day of each month. If it does not reach you about that date please be patient. Nine cases out of ten your copy will eventually arrive. If it does not, notify us.

EDWARD L. WILSON CO., Inc.

Publishers the Photographic
Journal of America

STATEMENT OF THE OWNERSHIP, MANAGEMENT, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,

Of THE PHOTOGRAPHIC JOURNAL OF AMERICA, published monthly at Philadelphia, Pa., for April 1, 1920.
STATE OF NEW YORK } ss.
COUNTY OF NEW YORK }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Thomas C. Watkins, who, having been duly sworn according to law, deposes and says that he is the Editor of THE PHOTOGRAPHIC JOURNAL OF AMERICA, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are

Name of	Post-office Address
Publisher, Edward L. Wilson Co., Inc.	701 Arch Street, Philadelphia, Pa.
Editor, Thomas Coke Watkins	122 East 25th Street, New York City
Managing Editor, none	
Business Managers, none	

2. That the owners are: (Give names and addresses of individual owners, or if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent. or more of the total amount of stock.)

Edward L. Wilson Co., Inc.	701 Arch Street, Philadelphia, Pa.
Thomas Coke Watkins	122 East 25th Street, New York City
Adah May Watkins	122 East 25th Street, New York City

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent. or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities, than as so stated by him.

THOMAS C. WATKINS, Editor.

Sworn to and subscribed before me this 24th day of March, 1920.

JOSEPH A. DUROSS,

Notary Public,

(Commission expires July 16, 1920.)



BY ARNOLD GENTHE
NEW YORK CITY



The PHOTOGRAPHIC · JOURNAL · · of AMERICA ·

VOLUME LVII

MAY, 1920

NUMBER 5



ARRANGEMENT OF THE GROUP

By JAMES WATT

THE further we advance in what may be justly termed artistic photography, the more we emancipate ourselves from that monotony of subject which has overruled the photographic representations of the last twenty years, the more pressing become the questions as to how, after the difficulties of the single picture have been successfully dealt with, other difficulties may be similarly overcome. One of the most difficult, perhaps the most difficult of all tasks undertaken by the photographer, is the efficient representation of several persons in one picture—the group. The group must consist of a number of single pictures together, but may not be broken up into isolated pictures. The space, looked at from a distance and as a whole, must appear filled with lines and forms expressing life and action as well as a certain amount of design. However simple these requirements may sound, they demand of the photographer artistic sympathy, much study, and patience.

He must be acquainted with the laws

regarding the structure of a picture; he must know the principles (akin to those of pictorial art) of composition; he must be able to separate the important from the unimportant, and to combine, suppress, or tone down accessories.

It seems, therefore, not out of place to write about these requirements, as only on the sound basis of knowledge and capability can art in photography be developed and protected from the so-called "works of art" which have so little to do with art.

Many of our up-to-date practising photographers do not possess energy, ambition, or love of their calling sufficient for self-education, and in thinking over the decline of the photographic industry we are forced to come to the conclusion that a considerable part of the blame is due to many professionals lacking knowledge and ability. It has been recently remarked that the beginnings of photographic portraiture indicated progression along similar lines to those now worked upon by the great bulk of photographers.

Originally, photography was practised by artists and by real art lovers, and we have pictures from among those "beginnings" which might well serve us as examples. This opinion is shared by many competent judges. When we consider how vastly superior are photographic materials of the present day to those of forty years ago, we think it would be well to investigate the reason of this retrogression and also find out the differences between the early photographers and those of today. Any connoisseur would tell us that the difference lies in the conception of the subject. We might reply: "Other times, other views," but nature remains the same. We would not wish, of course, to banish all that is modern—fresh methods of expressing beauty must ever be given a place of their own—but the fact remains that the point of view of most photographers is a very narrow one, and in only exceptional cases are we striving to repair the ravages of the photographic "man of business."

Formerly group photographs were taken by painters, men of artistic taste. How had they the advantage over us, seeing how far behind us they were in technic? They possessed artistic feeling, which we lack. They knew of nature from their own studies, whereas we know nature only through more or less bad copies. If we wish to overtake them we must, at least, use good instead of bad copies, and, above all things, we must return to nature.

With regard to the good copies, we can earnestly recommend our readers to obtain some of the beautiful reproductions after pictures by the old masters. They are comparatively very cheap. It is not enough, of course, for these pictures to be casually glanced over and then placed in an album. Their value may not be appreciated until the master's work be pondered over and studied carefully for perhaps a year. Let the student hang these, in simple frames, upon his studio wall; let him constantly look at and compare them (however useless this may at first appear) with his own work; and in time he will come to recognize a few of their wonderful qualities, and at the same time to

confess that in order to compose *pictures* in the stricter sense of the word he will have to set about his work in a very different manner.

Of course, not even the most skilful photographer could ever hope to produce a picture equaling a group of Franz Hals in composition, truth to life, or interest; but it is surely unnecessary to produce those groups so constantly met with of persons resembling wax figures in their pose, and with the light and shade perfectly evenly distributed.

When we speak of the masses of light and shade, balance and unity, contrast and harmony of a landscape, we must remember that the functions of these must never be omitted in the arrangement of a group of figures.

The arrangement of form, line, and space can be manifold, but must always aim at a self-contained, pictorial appearance. It is just as dangerous to "stretch out" a group as it is to select a monotonous background. Let the figures be posed as close together as possible without crowding, taking care that the principal person be the center of interest pictorially, and let the tones emphasize the important points at the cost of the unimportant ones.

An old writer has the following prescription for the composition of a group: "Give the first place unto the king, the next unto his attendants or other persons of note; should there be present those of lesser worth, place them without more ado in the shadow." This advice must not, of course, be literally followed, "those of lesser worth" being liable to take offence if treated merely as so much background; but the idea is right in principle. Figures placed in the shadow need not be on that account unrecognizable, and in following the above advice the difficulty of a "restless" appearance in the picture is obviated.

Straight, hard lines should be avoided, as much as sharp corners, regular, repeating shapes, and parallel figures and actions.

A lifelike photograph should seldom represent a symmetrical appearance, for only in rare instances do these occur in nature.

Let us consider another popular method of photography than which nothing could be more objectionable.

In having to do with pictures of a very large size, "cutting out" and "pasting on" are frequently resorted to.

After a hasty sketch of the general arrangement the persons represented, as well as the accessories and the background, are photographed separately in a given position, size, and light, and the plates are enlarged and printed separately.

Then begins the work of the retoucher. He laboriously cuts out the picture with knife and scissors and pastes it on to the ground according to his sketch. The edge of the photograph will then be erased, corrected, or completed with pencil and brush and united as far as possible to the ground. Afterward, when the picture is framed and glazed, the deluded public will either not observe the cutting-out business, or in observing will admire the dexterity and neatness with which it is carried out.

In the reduced photograph the work of scissors and brush is less obvious, but the picture possesses even less clarity and interest. The price of such a photograph must be very high, otherwise it would not pay to do the work, and the method is pursued in every branch of modern photography.

Many a reader may say, "Why disparage this method? Have we not for years attained good results, earned any amount of money, and satisfied our public with it?" We answer by describing the effect given by one of these same productions, which came, by the way, from one of the best studios.

In spite of every effort made by the photographer the "cutting out" and "pasting on" was sufficiently obvious to even an unpractised eye, any depth of tone was lacking, and the perspective of the painted background was wholly false, as the figures in the foreground were as clear and sharply defined as those behind, besides which, one beheld retouched boots and drapery, forced highlights, etc., and yet the whole tone was gray and of an equal value all over.

Could not even this method be used with better effect? Yes, with regard

to certain points, not with regard to all. Depth, perspective, and a natural effect must ever be lacking.

Money may be made, and a not too exacting and inartistic public may be pleased with the results of such a method, but a *good* photograph will never be attained by it.

It seems very necessary to do something to combat the one-sidedness and the limited range of treatment in present-day photography and as there is no means of learning, save by personal experience, we should use every available means of adding to our store. One of these means, demanding only diligence and a love of the art, is the hand camera. The study of typical or accidental appearances in nature by means of the hand camera is of the greatest importance both for groups and for single pictures. But how many photographers set to work in this manner? Most of them never bring their apparatus out of the studio; many of them look upon "snap-shooting" only as an amusement for amateurs. But is not the progress of many amateurs a proof that there are snap-shots and snap-shots, that instantaneous exposures can be made in an artistic spirit and can be of immense educational value? Thousands of opportunities are daily offered to the photographer of making studies of a charming pose, a quick, life-like action, and when he not only "snaps" but takes the opportunity of discriminating between the accidental and the characteristic, when he exerts himself to form of the scene a picturesque whole, and, finally, if he gives himself trouble over the careful finishing of the picture, even his studio work will derive benefit from the habit. Not only his technical powers, but also his powers of imagination will be strengthened, and he will find it easier to divide the natural from the unnatural. He will also keep further away from the set pose, which is always a forced and stiff arrangement.

Let us now run over the leading principles of group-taking. After receiving a commission to take a group find out first the number and character of persons. In many cases the studio may not afford sufficient accommodation,

but the question *where* the exposure is to be made being of the greatest importance, the artist should make himself accurately acquainted with the locality. Let him carefully note the light and shade and the background, which will probably require altering. Then let him make a hasty sketch of the arrangement, which, however poor in execution, will be of the greatest service to him. Lines leading upward and outward should be looked for as giving life and

action. After making this sketch pose the persons and strive to let them forget that they are about to be photographed (this will present some difficulty) and to look as if there were some meaning in their being thus assembled.

Then comes the critical moment of exposure, only to be rightly decided upon by the artistically educated photographer. It seems at first an impossibility, but even here practice will make perfect.

THE PERSPECTIVE AND VALUES OF A PHOTOGRAPHIC BUSINESS

THROUGH proper rendering of values and perspective in a picture or photograph we see things in their correct tone or shade, and get a suggestion of their relative distances. This sane faculty of distinction and discrimination, used in a different way, is also the main secret of commercial ability. The successful studio worker, who captures customers and currency, is he who fully understands, in addition to artistic and technical laws, the perspective and values of business.

As Cicero pointed out long ago, in "De Oratore," almost anything can be reduced to a science by analysis and classification, if only sufficient facts are available for sorting out. In the critical study of prosperous workers *versus* the failures certain outstanding points and features are sure to be noted, which may be boiled down and crystallized into aphorisms and laws.

We do not see things in their right depth if we undervalue capital, nor in their real perspective if we overlook time. Thus, a new photographic business should not light-heartedly be launched without enough spare cash in reserve to tide over an initial period of slackness, should it unexpectedly arise. It is the first six or nine months' waiting that breaks the unwary newcomer, who might have won through to permanent ease and comfort if he could have held out a

trifle longer. A wise man always allows a margin. He has learned that though rugged obstacles seem dwarfed and softened when viewed from a distance, they are none the less present if they have force to be approached.

Then the values and perspective of locality. How nicely they need to be weighed; how futile to imagine that the same haphazard treatment will do for each and all! How the erstwhile West End portraitist flounders, like fish out of water, if he tries to work on the same lines in Stepney or in Burslem; how speedily comes disillusion to the "while-you-wait" artist who opens up in a "genteel" suburb! Of course, these are extremes, where there is little excuse for a mistake. Real finesse makes itself evident in the detection and appropriate handling of far subtler shades of difference.

Of very great moment is the capacity to gauge those gradual and almost imperceptible changes that localities are sure to undergo sooner or later and to adapt oneself thereto. It is quite common to find a once prosperous photographic business stranded and decadent, though doing quite as good work as ever, merely because it has failed to move with the shifting world around it, and to identify itself with local fluctuations. Old friends and clients remove or are lost and no new ones are made; competitors are

suffered to create and cater for an altered taste without attempt at rivalry, there is no effort to keep up to date as to exterior, decorations, furniture, advertising; no endeavor to "go one better." Again, it is purely an omission to realize perspective and values—as they will appear to others.

False economy, an allied phase of tonal indiscrimination, is often found in those very directions where adequate outlay is most essential. It is especially foolish to be miserly over apparatus, materials, or display. Here, to spend wisely is emphatically the way to get.

A wrong perspective may be noted in two opposite and contradictory recipes often given for early arrival at a good bank balance. One is to see to everything yourself, the second to make others do all the work for you. Both are half-truths. Experience teaches that the way to distance competitors is by constant personal supervision, coupled with the delegation of details to well-selected competent subordinates. To separate the two things is destruction. The enthusiast of a "one-man" studio, unless a sought-out genius who can command his own prices, is either forced to admit that energy has limits, or gets a premature obituary notice.

"But," someone may object, "this is scarcely a matter of preference. The single-handed photographer probably dispenses with assistance simply because he cannot afford it." Precisely. But the fatuity of doing so is constantly and sadly obvious to all who have ears, eyes and brain. The ambitious one had far better remain an assistant for the major part of his life, till he can manage to start with at least a single helper—rather than embark "on his own" with inadequate capital.

Organization demands its own perspective and values. A wise employer will see that he has effective control, and is not a mere figurehead; that there is order, system, a definite place for everything; that work is rationally divided. He will take care that each detail of production and all overhead charged are "costed," and that the smallest order bears its due proportion, to show a sufficient percentage of profit. Nor will he

forget that cheerful and healthy hands give the largest and best output.

The selective faculty needs exercise respecting prices and profits. It is asking for future trouble to underbid, and for present to profiteer. People expect definite charges, plainly stated, preferably without having to come inside to ascertain them. The studio where they suit the price to the sitter, or take mean advantages, soon goes to the dogs. The coupon and the free sitting are to be avoided. The public despise what seems to be at a discount, but flock in queues after what others fancy desirable. Two golden business rules are: Do not raise excessive expectations, so that a client may be agreeably surprised rather than disappointed; and never make promises that cannot be kept. A third is to suffer fools gladly, since a large proportion of inane chatter leads to orders. The really prosperous man knows how to talk—or, rather to listen.

The showcase or window ought to stop passers-by like a bullet. If they do not stay, the photographer will not either. Nor must its magnetism be allowed to deteriorate through lack of frequent change. While never forgetting that his photographs are not a necessary of life, the man who would sell them must do his level best to make everyone else forget it. The specimens should by no means be selected only from beauties or Apollos. It is sound policy to include a fair sprinkling of downright ugly people. Then those with but moderate looks—who form, in fact, the great majority—will not be frightened away, nor the severely practical repelled.

Not only to uphold the prestige of his craft—a consideration to which some are regrettably and imprudently indiffering—but because a flattering social valuation is one of the most essential ingredients of success, the photographer must endeavor to fill his due perspective by studying manners, culture, diction, dress in a non-fussy, sensible way, that will render him liked and respected by all whose opinion matters. Vulgarity and sloppiness do not pay nowadays, even where they might not unreasonably be expected to.

Taken as a whole, sitters are dis-

gusted with "kow-towing," neither will they long tolerate one who acts as if conferring a favor. Both are ghastly mistakes from a business standpoint. How much recognition of the perspective and values of character is suggested in the Pauline method, "All things to all men!" Taken in the narrower commercial sense, it affords another key to prosperity, and its importance to the photographer especially cannot be overestimated. It implies an intelligent appraisal of others' likes and dislikes, fads and fancies; the accurate grading of humanity and femininity; the ability to humor and influence, with a sympathetic tact. Let the grumpy, unpolished, and unsocial abandon the vain attempt, or keep carefully out of contact with sitters, for their work in the studio or reception-room will be wasted!

As final advice, always be looking for

something new, in styles, sizes, mounts, lighting, treatment. Constant production of "the same old thing" is almost as bad as never changing the showcase. Watch other business and professional men, not only photographers, and jot down items likely to be useful. Don't go by what they say, but what they do. Ponder most those points in which the successful agree, also those which characterize the failures. Sort, classify, and analyze. Be guided by the stream, but do not mistake a temporary puddle for it. Follow things to their consequences, deduce causes from effects. This is the genuine philosopher's stone of business success, for it leads to an infallible grasp of true values and perspective, helping one to put the unimportant and trivial in its own insignificant place and to devote attention to the things that really matter.—*British Journal*.

THOUGHTS ON STYLE

BY F. C. TILNEY

WHATEVER one may feel bold enough to say to the amateur pictorial photographer in the way of advice, to come before the professional portraitist in the role of mentor is not a part one volunteers to play.

It is a real truth—though naturally I try to hide it—that I am deluged with my own modesty before the man who can make a handsome living by taking likenesses. He has so much on his side already that I feel my opinions must be worth little or nothing to him. He has his experience, his own well-tried methods, and, as the outcome of these things, his routine. Why should I butt in? If he is a successful man, he will smile at my short cuts to artistic reputation: if he is unsuccessful, it is probably from causes which I could not touch.

Nevertheless I have been asked to meet him on the common ground of this charming little magazine. It is an

honor that I do not wish to let pass. All the same, the blood, if there is any, be upon the head of the courteous editor. Certainly, it is not my first appearance in these pages; but it is the first time, I think, that I have deliberately set out to offer my goods in this particular market, already well-stocked with my particular commodity.

In the first place, then, is artistic portrait photography—or what is known by that name—possible and profitable?

There was a time not so many years since when a leading West End professional man confided to me that he had started his career in London in the sure and certain hope of taking the town by storm. He would show them! No more tickled-up conventionalities! He would give them something strong, virile, direct, beautiful. He started to do so, and in a few months found that it meant putting the shutters up. To keep things going he just had to fall in line and give old ladies beautiful



A STUDY IN HAND POSING
BY CHARLES H. DAVIS
NEW YORK



likenesses of themselves that would do for girls of nineteen. From that moment he prospered.

There is, however, a new spirit abroad today. How it has come into being, whether from the public or from the photographer, is difficult to say. My own opinion is that that rusher-in where others fear to tread; that irresponsible revolutionary, the amateur, who prances in utter obliviousness of damage over all the practices and conventions of the studio and dark-room; who underexposes, trims his prints in the dark, stains them with coffee, tea, cocoa, oxo or anything fluid within reach; who mounts them on waste-paper and gets an infant son to letter their margins—he, the mad amateur, has upon occasion stumbled upon some bright ideas. If a man lets himself go enough, he will be sure to make a pleasing fluke or two.

In the course of time the amateur's vagaries have been taken in hand, treated with taste, skill and judgment, and finally have been laid as the foundation of a new style. In many cases the amateur himself has stepped off his privileged ground and opened shop. It cannot be denied that his influence has remodelled the old order of things. Would these highly revered firms who boast of the most select connections, and sport the royal arms, ever have developed so far upon their own initiative as to produce, even as a side-line for show or gallery exhibition, the audacious things that bear the single trade-mark sort of name of two or three firms flourishing today?

There is something excitingly fresh, irresistibly compelling, in the latest output of a few of the studios which undoubtedly owes its origin to the amateur's absurdities. How did it come about?

To my mind the case can be put in this way: The amateur works for kudos, not for cash. He does a thing in a devil-may-care sort of way and has no anxiety of the consequences. He cannot lose the order, because there is no order to lose. If the sitter of whom he is making gratuitous studies doesn't like the result enough to take

it, he can leave it, and no harm is done. But the professional cannot enjoy himself in this way. When he works it is for a customer who has already pulled over all the specimens in the showroom and has finally decided upon having something "like that." If it isn't like "that" the print may be thrown back on the photographer's hands, together with all the work it has involved. It is there that the professional finds that it does not pay to experiment; and he, in his commercial wisdom, goes on doing the safe thing, with the slowest possible changes in style tentatively creeping in.

Further, those very changes are for the most part but changes of treatment in the processes after exposure. The amateur's "eye-peeler" were the result of monkeying with the camera and the sitter too.

The question presents itself whether it is not possible for the professional man to take this pioneer work out of the hands of the amateur and commence to educate his public himself. The times are vastly changed since the day of the sanguine West-Ender of whom I spoke. The art of painting has gone so hopelessly mad that people are now, almost to a man, firm in the belief that a thing that looks unlike anything that ever was done before is probably the thing to possess, since it implies a highly cultured exclusiveness in its possessor. This doubtful tendency on the part of the public at any rate opens a door to novelty of idea in the photographic studio. It does not follow that the new must always be bad. Nothing is bad that has Nature behind it. With a camera one is always holding the hand of Nature. All that is wanted is a change of the old conditions.

The greatest latitude is ever with the most artistic worker. A thousand and one ways of doing arresting work that is good art remain yet untried. The public are panting for them. They are possible and they will prove profitable.

My readers will probably say, "Go ahead! What are they?"

It will be a pleasure for me in suc-

ceeding issues to make a few suggestions that may help to answer that question. At present I can do no more than raise the notion for individual consideration.

It should be stated here, however, that any development of ideas in these pages will take a line along the solid ground of Nature and sound art principles. Those principles, being as they are the response in our minds to our natural experiences, are safe in the hands of photography as long as mere trick is avoided. We must be careful that in the part of the procedure where

the camera is not concerned, as in posing, lighting, design and so forth, the sound principles of art are not violated, because if they are the efforts will be futile.

To go in opposition to our experiences of Nature is, *ipso facto*, to produce the thing which everybody recognizes as absurd. It is often done, but never with impunity. The Art that gives the lie to Nature or even that represents Nature in a way different from usual human experience can never have a wide appeal. — *Professional Photographer*.

SOME CONSIDERATIONS OF STRAIGHT PHOTOGRAPHY AND CONTROL

By ANTHONY GUEST

A GOOD deal of attention has lately been directed to "straight" photography. Its zealous advocacy has tended to set up a state of rivalry between this method and the processes of "control." If the one is right the other must be wrong, is apparently the view of some controversialists, who do not seem to have considered that there may be room for both; still less, to have endeavored to determine the proper function of each.

It is unnecessary here to refer to the many directions in which the camera's "plain unvarnished tale" is of the utmost value for military, scientific, and industrial purposes. Pure photography has here a wide field entirely to itself as the unrivalled discoverer of and witness to facts, sometimes microscopic and unsuspected, and in some cases disputed until the point at issue is finally decided by such unbiased evidence as that of the camera picture.

But the present question concerns the artistic development of photography, and it is only in this comparatively limited sphere that "control" has its chance. Even the crudest fake may be credited with an artistic aim, so long as

it is not perpetrated with intention to falsify the truth. It implies an effort, however futile, to enhance the beauty of the print, generally through selection and coincident suppression, which are indispensable to artistic expression; and there are those who do not see why these resources should not be at the disposal of the artistic photographer. But he is sometimes deterred by the objection that such practices bring about perversion of fact.

The "straight" photographer also claims to produce artistic results. He employs selection in the choice of his scene and in the choice of his moment, but these are responsibilities that all photographers must inevitably undertake. Once the exposure is made by the apostle of "straightness," there is no more selection, and nothing is suppressed. Only the pure statement of the camera, it is held, can give the real rendering of fact.

The ideal of the photographic purist, therefore, is the perfect print representing the genuine impression received and recorded by a perfect instrument. So he carries out the excellent artistic principle of devotion to, and faith in,

the medium with unsurpassed thoroughness.

The question is whether he does not carry it too far, and whether such unlimited confidence in the instrument may not lead to its becoming the master instead of the servant. Still, the adherents of this kind of work often send examples to the exhibitions of such high technical excellence, and so attractive in subject, that they win a good deal of admiration and many followers. They are the exponents of the possibilities, and inevitably, also, of the limitations of one phase of photography.

To many admirers these limitations are not apparent; indeed, their existence is not always admitted even by the workers themselves. The fact is that there are more people who can pick out a false note in music than in the tone-values of a picture; but, even so, the conductor of an orchestra detects many an error that is unnoticed by the audience.

The camera, with all its merits, cannot be completely relied on for truth of tone, and therefore those whose perception is sensitiveness to its faults claim the right to correct them by means of "control." This does not seem any more unreasonable than to require that a piano should be tuned on occasion arising. Tone means much; it conveys the inner significance or spirit of a scene, light and atmosphere, emphasis and distance, and the intangible elements that constitute feeling, poetry, and life. Due relationship of its gradations confers a sense of distinction on pictorial work.

To those who regard photography as something more than a record of accumulated facts, as, in fact, a medium for expression of what the artist individually feels and sees, personal control for the correction and harmonizing of tone is an essential factor. Without it photography might reach the zenith of craftsmanship; but the artist would have to seek a more flexible and responsive medium, whereby selection and suppression—the means of accentuating the idea as distinguished from the facts—would be available not merely for choice of place and time, but for application throughout the design.

The importance that some photographers attach to facts implies a misapprehension of their significance, and a failure to distinguish between fact and truth. Fact is not truth. Truth is a synthesis of many facts, ordered and considered in relationship one to another. A fact as recorded by the camera may be beautiful in itself, but it may also be a contradiction of the fundamental truth. Also, a fact, unless adjusted to its proper pictorial value, will certainly exercise a disturbing influence on the composition.

There is another potent reason why the uncontrolled print cannot be relied on for a record true to human apprehension—to say nothing of the trained vision of the artist. The camera has a single eye; the man, having two, receives his impressions from different angles. It might be thought that the slight divergence of these two points of view would make only a negligible difference, and probably, for the common purposes of life, this is true. But the artistic difference, if subtle, is by no means unimportant, as anyone may convince himself by a simple test. Look at an object some twenty-five feet away, first with one eye, then with the other—an upright stick, or perhaps one of the uprights of a window frame would serve the purpose—and it will at once be noticed that the object under this alternating vision appears to change its position in relation to the details beyond. Moreover, the shadow side of the object, seen clearly and sharply with one eye, will almost disappear, and the lighter side be emphasized, when seen with the other. Hence, the single vision commits the observer to a definite and uncompromising picture that contrasts with the softened and more poetic impression resulting from the two angles of sight with which nature has endowed us. Nature is always working for beauty and here is a proof that while providing beautiful scenes and things for the elevation and refinement of a not too appreciative human race, she ensures that they shall be seen in a beautiful way.

In dealing with portraiture and expression, the difference between single and double vision is especially significant

for the sharper and more fixed rendering of the single eye lacks the sympathetic quality of a less uncompromising vision that imparts a sense of life to the human face. But whatever the subject, the double vision reveals a delicate play of light that tends to eliminate hard outlines and to introduce the appearance of animation to vitalize and augment beauty.

A no less important consideration in comparing human vision with the single eye of the camera is that in one case the image is reflected on and inevitably modified by an intelligence, while in the other there is no such discriminating, selective, or idealizing influence. If art is nature seen through a temperament, the artist-photographer cannot be content with such an uninspired record as that to which the instrument, though skilfully guided as to length and moment of exposure and helped out by perfected technical conditions, must still be limited.

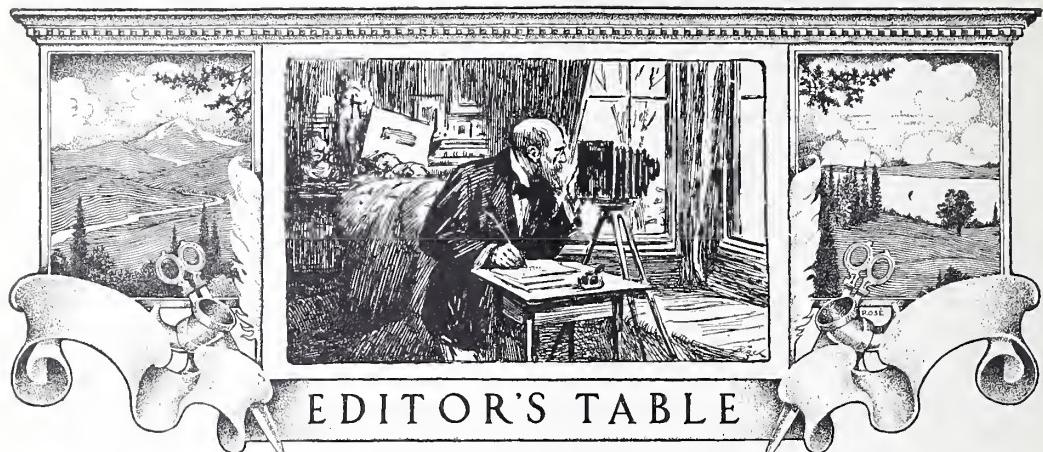
So there is much to be said for such modification or control as will correct faults and add something of the individual preferences, temperament, and feeling that make up the human impression.

The more vivid and compelling these influences are to the worker, the less will he be satisfied by pure photography as at present understood. But if the photographer is one of the many who are sensitive to natural beauty in a general way, but have not troubled about the artistic principles that inform discrimination and have not sought the subtle elements of the spirit and poetry of a scene, the "straight" print, which approximates dangerously to reality, may well afford an acceptable souvenir. It may also be educative, for familiarity should in time open the owner's eyes to

the absence of the essential something—his own emotional delight in and communion with the life and beauty of nature—and if he is keen enough to seek an explanation of the deficiency he will be on the way to progress.

In skilful hands "straight" photography can yield beautiful examples of technic, eliminating some inherent defects of the medium and producing a surface that in itself is pleasant to look upon. The prints at their best are so insidiously clever that shortcomings are unnoticed by an uncritical public, who are liberal in their praise of fine results of the undoubtedly skill devoted to the work, and do not demand "the little more." After all, the "straight" print serves to glorify photography rather than to express the individual or to do homage to nature and art.

"Straight" photography represents the craftsman's ideal, and so far it serves a useful purpose. It may do much more; it may, indeed, be the most important factor in photographic progress. The artist-photographer must be a craftsman before he can express himself, and it is most desirable that he should do so as far as possible by pure photography. Though I doubt whether this can ever be fully accomplished without some methods of "control," it must be evident that all the efforts that are being made to raise the "straight" print to an artistic standard must tend in the long run so to increase the flexibility and power of the medium as to bring it nearer the artist's requirements. If these efforts are continued the need for "control" will probably in time become diminished, so that "straight" and "controlled" photography may perhaps one day be brought so near together that they may shake hands across the dividing line.—*Amateur Photographer*.



EDITOR'S TABLE

TO OUR READERS

IT has been our pride for years not only to maintain the high standard and quality of this magazine, but to give our readers a large and generous source of valuable and helpful information. Now we are seriously confronted with a stringency in the paper market in this country which is fast becoming acute. It is quite impossible to obtain certain qualities and quantities of paper and the publisher is compelled to accept only what he can get. Thus it is that our readers will notice a slight change in the paper we are now using. But the situation is not permanent—conditions are sure to right themselves. In the meantime we ask the kind indulgence of our readers and friends, and we will make every effort to spread a more serviceable monthly feast, even though our "dress" is not of the best material.

POSING MEN

THE average man is not a satisfactory object for the photographer's art. Perhaps this is largely because we have not studied our male sitters with the same close thought and attention which we bestow on our lady customers. In the latter case we have often great assistance in the clothing of the subject; and our greatest help is the natural inclination of a woman to endeavor to look her best at all times.

(182)

The man depends for his appearance, on a few stock lines, clean linen and boots, a shave, and clothes well brushed or pressed.

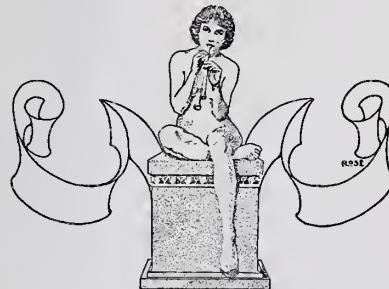
When the man enters a studio there is often—though perhaps unconsciously—a feeling of restraint. How many men nervously stroke their hair back or endeavor to adjust their collars. The man is in fact reverting to the time when he suffered under the Sunday scrub and hair-brushing, that never-to-be-liked *interim* when romping was forbidden and decorum reigned supreme. The woman in entering the studio is only experiencing the sensation which she feels daily when she dresses for the evening or titivates before the glass. The first thing, therefore, that the man does when he is posed is to hold his breath and refrain from winking; in short, to become uncomfortably self-conscious. And the most the photographer can get is a mere map. The man is suited with the picture, perhaps, and his family think it is lovely and "slicked up," but still they keep a miserable little snap-shot, underexposed and badly printed, which has more of the life of the man, because the man thought it was fun to be taken, and grinned at the camera. *Give the man something to do.* In many a case the man is squared up for the ordeal, and he is resolutely gazing at some mark on the wall.

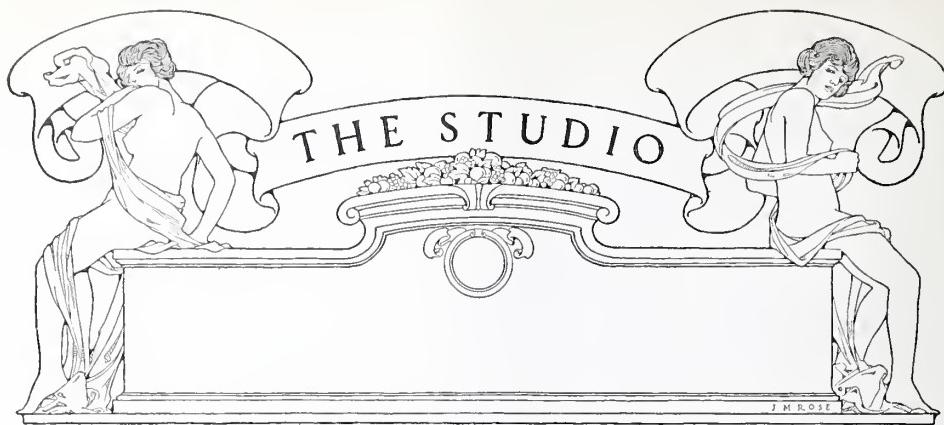
Do not imagine that because you have placed your sitter in a back corner of the operating room, where only a

few stray rays of light can reach him, that you are practising art principles. Do not think that the use of any so-called system of lighting is going to make you artistic. These things are all right in their way, but are mere trifles compared to the art knowledge that must be back of them in order to make any intelligent use of them. You can make no worse mistake than to copy others. Practice effects, but be sure your method of illumination is helping tell your story. To exhibit all your efforts and insist that they are the proper thing will only demoralize your business and give you a false idea of your own abilities. We think one of the prevailing errors of those who attempt the so-called artistic effects is that they are impressed by a certain style of lighting, and in order to get as far away as possible from what they have been doing they exaggerate that effect. We do not believe that rug-

gedness is the chief virtue of art, and do not believe in the bald statement that art is truth. Art can have no higher aim than a dissemination of a love for the beautiful. If you will remember that the human head is a ball, and to retain that rotundity the further portion should be in deeper shadow than the nearer, you have learned one lesson of art. If you will remember that one of the essentials of a picture is to tell its story, you will have learned another lesson. *Educate yourself and you will educate the public.*

To educate is, indeed, the key of the situation. It is the man who trains himself who improves. "I fear my work won't quite please you," wrote a subscriber recently, "because I keep trying new lines, and am sometimes a little shaky on them." The man who is trying new lines is educating himself, and his distrust of his work is evidence that he is improving in it.





PRACTICAL PAPERS ON STUDIO WORK AND METHODS

Daylight Where You Need It

By A. J. CUNNINGHAM

THERE isn't another profession or business in which so many things are used, which were never made for that use, as in photography. This is especially true of commercial work. It seems that almost everything made has its use somewhere in the making of photographs; from the children's modelling clay, or Plasticine, to the sugar which was found to be a component of some of the war-time metol substitutes.

One of the handiest of these articles, and one which is particularly adaptable to our efforts to make "better pictures," I have found to be the garage lamp.

In the average printing-room, lighted with orange or yellow light, no provision is made for examining prints by daylight or its equivalent. We know from experience that it is impossible to judge the true tone of a print by this yellow light. Of course you may know that when a print has a certain appearance under the yellow light it will be correct by daylight, but this is an inaccurate method at best and is bound to produce a variation in results.

On the other hand, it is common practice to take a print, or a few of them, to a window, where they may be examined by daylight, and of course this gives the desired result, but the window may be quite a number of steps from your hypo tray, and there is a loss of time as well as energy. In the end you no doubt give it up and take a chance on your judgment under the yellow light.

It is just here that the garage lamp saves time, energy and paper. The one which I have in use and which has given me such wonderful satisfaction that I must pass it on, is an ordinary, portable lamp, as shown in Fig. 1, and which is obtainable from any dealer in auto supplies. It consists of a socket on a handle, to which is attached a wire shade or protector, and is fitted with about twelve feet of flexible lamp-cord. There is a plug on the other end of the cord, which may be screwed into any convenient light-socket.

A suitable shade must be made to prevent the rays of light from striking anywhere except directly in front, like an ordinary flash-light on a large scale. The best material for this is the

black paper which comes around your paper. It is tough and fairly repellent to moisture. A metal shade might be made, but it will quickly rust unless properly protected and must be replaced, and although the paper one will need replacing, it costs nothing and it takes about five minutes to make.

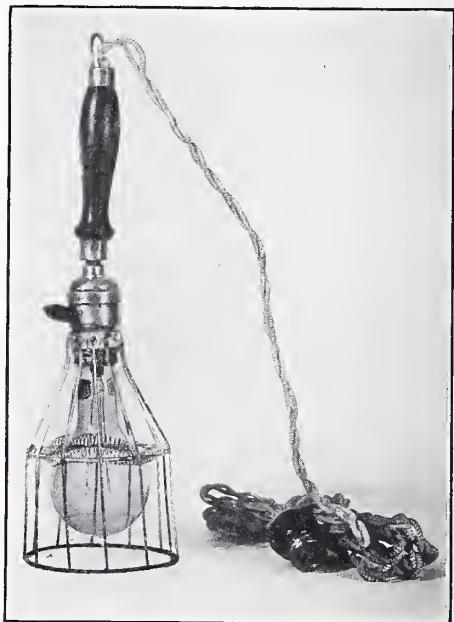


FIG. 1

First, cut a piece of black paper about $2\frac{1}{2}$ inches wider than the depth of the wire frame and long enough to go around it with an inch and a half to overlap. Bring this around the base of the wire frame, leaving the two and one half inches extending below the frame. It may be held in place with a piece of cord, or, better still, with a piece of gummed tape such as is used to

seal packages. It comes in rolls and is very handy about the workrooms. Adhesive tape answers well but is not so permanent. Next, by folding in at a few places, the paper may be fitted around the top where the frame tapers to the socket, and again held in place with a piece of cord or tape. Now tuck the two inches, which extend at the bottom, inside the frame, and finish up by putting a band of the adhesive paper around the bottom, as shown in Fig. 2, to strengthen the whole and protect the edge.



FIG. 2

For a bulb use a Mazda "C" lamp of 75 watt. This is the blue nitrogen globe.

This lamp gives the closest visual effect of daylight, which is, of course, of the utmost importance. With it you can detect the slightest variation in tone as well as any turning of the whites. This is invaluable to the kodak finisher or commercial photographer, when finishing large numbers of prints, to detect discolored margins due to forcing or old developer.

Fig. 1 shows the lamp complete. You will note that the bulb does not extend quite to the bottom of the shade. This causes the light to be thrown straight in front of the shade and eliminates any danger of fogging paper by stray light. Have the lamp standing or hanging beside your hypo tray, and it is a simple matter to look at any or all prints by merely turning on the light and directing it straight down on the tray. In fact, you may point it anywhere except directly at your paper with no danger of fogging.

Its uses are manifold and a short trial will make it a very valuable part of your equipment. The expense is light and it is bound to mean prints of a more uniform quality without the slightest trouble. Use it. It is a handy weapon in your campaign for "better prints."

Commercial Specimens

THERE are many photographers quite capable of turning out good technical and commercial work who fail to secure orders in this department for want of a little business knowledge or method. As a rule the display of specimen photographs is poor, not perhaps in quality but in variety and in the way they are shown. As a rule manufacturers are in the habit of dealing with skilled travelers or agents who make a point of presenting samples and sometimes photographs of their wares in the most attractive way possible, and they hardly know what to expect of a man who shows a few dog-eared prints of various subjects, none of which are, perhaps, quite what they require, and who is rather uncertain as to the

prices he is willing to accept. To obviate this state of things the photographer must put in a little time making negatives for specimen purposes only, and be prepared to give a few prints in return for the loan of originals, if needed. In many towns if a photographer is a good neighbor he can borrow china, glass, plated ware and the like without any trouble, while at the local garage the proprietor will usually be glad to run out a car or two in return for a print. And the caterer for the manufacturer or the merchant must consistently keep in mind that photographs are required on account of their merits in selling goods; their technical qualities, while they must be of a high order, must also be applied to this end.—B. J.

Studio Decoration

THIS spring will probably see quite an unusual amount of furnishing and re-decorating of studio premises. The high cost of materials and labor will doubtless prove deterrent in some cases, but where the principal or his most valued helpers have been away for four or five years there has not been much opportunity to keep things spick and span, and the time has come when re-decoration can no longer be delayed.

Before setting out on any scheme, it is advisable to give a little consideration as to the color of the walls of the studio, as it is sometimes possible to effect a considerable improvement in the work by adopting a lighter or darker color than the existing one. As a general rule, it will be found that a studio on which direct sunlight falls during part of the day may have with advantage the walls of a darker tint than one with an absolutely northern aspect. The color, apart from its depth, should also be chosen with due regard to the aspects, as it is easy to make a studio appear too hot or too cold by injudicious coloring of the walls. For example, we have seen a sunlit studio in which there was a dull red dado, the walls above being warm buff, while the floor covering was red buff and black. Such an arrangement cannot fail to give an impression of heat when a sitter enters on a summer's day. In the winter it may look cosy, but it is much easier to create an impression of warmth in winter than coolness in hot weather. For the latter, cool grays or greens should be used, the depth of tone being regulated by the amount of light in the studio; a strongly-lighted apartment calls for darker walls than one which is more shut in by surrounding buildings. It is, however, open to question whether the studio walls should be considered as playing any part in the lighting of the sitter, or whether such reflected light as may be needed should not be provided by proper reflecting screens.

Oak panelling, real or the Anaglypta imitation, makes an excellent lining for a studio, and occasionally comes in well as a background. It is best when finished in a fairly dark color, the warmth or coolness of the room being suggested by either reddish or buff walls above the wainscot for warm effects and green or pale gray for cool ones.

If the expense of panelling be objected to, an excellent effect may be produced by using art

canvas or Arras cloth divided into panels by strips of wood, which may be painted or stained at discretion. Distemper should not be used except on the ground of cheapness, as it rapidly becomes shabby by having furniture and accessories pushed against it, while finger-marks or other stains cannot be washed off.

As a rule, such part of the ceiling or roof as is not covered with glass may safely be whitened, as, from its position, it will provide a certain amount of reflected light, without causing flatness. The sash-bars and any frames round the glass should also be white or pale gray, that they may reflect as much light as possible. When festoon curtains are fitted, the color of the dark ones should be made to agree with the general scheme, either matching or forming an agreeable contrast. Thus, with oak walls, the blinds may either be brown or green, the aim being to avoid using too many colors; black is usually considered as too heavy in effect for curtains. When color relief is needed, a hint may be taken from the artistic housewife who makes use of patches of decided color in the form of cushions, and these may also be turned to account in posing.

When re-decorating, the furniture should not be overlooked. Anything which is obsolete or damaged beyond the possibility of repair should be removed and the remainder put in good order. If one or two new articles can be added, so much the better, but, as a rule, studios are overcrowded, and a little weeding-out will be all to the good. The camera and stand often form an eyesore in an otherwise dainty studio, for many excellent instruments were designed without any other idea than usefulness, and when they have lost their original color and received a few bruises they look rather hopeless. In such a case we have seen an excellent effect produced by thoroughly cleaning the woodwork, sand-papering down any roughness, and giving two thin coats of black Ripolin, which converted rather a piebald combination into a respectable black one, a new focussing-cloth of moss-green plush completing the transformation.

Backgrounds, diffusers, and reflectors also need overhauling. Scenic grounds are rarely used nowadays, and those which are on the retired list should be given a coat of plain distemper. Black, white and medium gray are useful, in addition to any graduated or scenic grounds which may already be in use. The metal frames of diffusers, reflectors, and the whole of the headrests are best painted a medium gray.

We would emphasise the necessity for giving as much attention to the contents of the studio as to the structure itself, for nothing can look worse than a lot of shabby furniture displayed against newly-decorated walls.—*B. J.*

At-Home Portraiture

THE speed with which one can travel long distances by motor-bicycle, and the fact that the latter can be bought on the hire-purchase system, have enabled many practitioners of more or less ability to invade the preserves of the country and suburban professional and gather the choicest fruits. There is also the top-hatted and frock-coated interviewer from the metropolis

with his train of skilled operators to be reckoned with, and it behoves the country professional to see to it that his work is unsurpassed by either. The multiple-shop companies, possessing factories for printing and finishing, thereby securing the benefits of uniformly good quality that can only be obtained by employing specialists in each department, fairly compel him to turn out to seek fresh customers, and unless he can offer something different at a moderate price he will be well advised to apply himself to at-home portraiture and commercial work. It is a branch of the profession having the advantage of not being a season trade, there being an abundance of work both in winter and summer to be had for the asking.

Now, to become a successful "at-home" photographer, one whose work is distinctive, artistic, and pleasing, it is necessary, besides being master of the craft, that you possess artistic ability, initiative, tact, and are fond of children and animals, and unlimited patience and good temper are absolutely essential. If you are deficient in the above, secure as your assistant one who "fills the bill."

For this class of work it is essential to have a conveyance of some description. Going by train is both expensive and inconvenient, often an impossibility. Choice rests between a pony and trap or a small two-seated motor-car. One of the latter with a small van built at the back would be the most useful.

Your equipment must include lenses to meet every contingency. Views of the house may be required, which may necessitate either a wide angle or a telephoto lens. Portraits of children playing on the lawn will require one of 7 or 8-in. focus, but for portraiture a lens of at least 13-in. focus is necessary. A three-times color screen should be included in the outfit and ortho plates placed into the dark slides.

Telephoto lenses, and sometimes the front or back combination of a rectilinear, prove useful when visiting a mansion that has a pleasing aspect when seen from a distance. It may be placed among trees with a pleasing background of hill and sky—a composition entirely lost at close quarters, for a wide angle lens cannot show what lies behind the house. A successful picture of this description is sure to please your client and enhance your reputation. The 8-in. lens is useful for views of gardens and genre work, as it has a fair depth of focus at open aperture. It is also useful for portraiture in small rooms, but the 12-in. or even longer focus lens should be used, both in and outdoor, when circumstances permit.

When making views of the gardens every effort should be made to secure pictures that will please. As you are aware, your client has been seeing a sort of composite picture in the view he wishes you to take, and unless you carefully consider what the result will be you may only get a merely illustrated ground plan, with a poor order for your pains.

Always aim to show a motive for the picture; emphasize something. If the view selected is made up of a number of small beds, which as the eye wanders from one to another give some a beautiful composite impression of the whole, the

camera will but give you the aforementioned uninteresting ground plan. Rather approach more nearly one section, so that it dominates the composition and suggests what the rest looks like. But if your client insists on the ground plan, persuade him either to be in the picture himself or put one or two members of his family into the composition. It will put it together somewhat. The same applies to lawns bordered with trees; unless you can get a foreground or middle distance study, the pictures will be flat and uninteresting. If it can be managed, greenhouses and conservatories must receive similar treatment. You will generally find the gardener, when he knows your wants, only too willing to stage the plants to the best advantage for photographing. Footpaths through flowering banks and borders must be so managed that the gravel-path does not come out as the most prominent part of the picture. The wealth of bloom is the motive of the picture, and be sure the most prominent plants are so carefully focussed as to give the keynote of the whole scheme. Should the lighting prove unpropitious for what would otherwise make a good picture, a second visit at a more suitable time should be made.

Garden portraits well executed are very pleasing; but the picture that gives the most pleasure is one that portrays a rather small image of the sitter, taken in a carefully selected part of the grounds, and giving the impression of being the work of a clever amateur with an appreciation of pictorial composition.

Indoor portraiture will tax the operator's craftsmanship to the utmost. He will rarely find two rooms alike. Take two rooms both

alike in size and shape; in the one two seconds may be ample exposure for the subject; yet in the other seven to ten seconds may be necessary for the same subject, the reason being either that interior decorations are of sombre hue or light precluded by near trees or buildings outside. Some writers recommend exposure meters, but an operator gravely watching for the tints darkening in a poor light is apt to give the sitter a bad attack of nerves. The quickest and best method is to use a calculator, which demands that you use your judgment on the environment and weather, and then you will not be nonplussed should the light suddenly change and grow brighter or dull. But whatever the means adopted, err slightly on the overexposed side.

I have worked in rooms where reflectors have been quite unnecessary. In others it has been necessary to use a full-sized sheet, to which I have pinned pieces of brown paper to parts requiring such suppression.

It is a good plan to pose either your assistant or one of the maids, and after focussing to request your sitter to imitate the proxy—a mode of procedure that tires no one and accelerates the sitting.

Garden scenes printed in carbon, full advantage being taken of the range of colors this process offers, will, if good negatives have been made, considerably enhance your reputation and lead to further business. Do not let bromide paper be your only medium simply because it is capable of allowing large quantities to be got through quickly. It is this ease of production that brings all this competition about your ears.—J. H. ROBERTSHAW in *B. J.*



Sensitizing Carbon Tissue

NAMIAS, of Milan, points out that the neutral chromates give a much less sensitive carbon tissue than the bichromates, and that the addition of an alkaline caustic or carbonate to a solution of a chromate completely destroys the sensitizing. It is well known that the spontaneous insolubilization of the tissue runs *pari passu* with the sensitiveness; therefore, Namias argues that tissue sensitized with alkaline chromates will keep indefinitely, which (if true) will enable us to store chromated tissue for any length of time, and to render the same sensitive again, one has merely to expose it to the fumes of a volatile acid, like acetic, to confer sensitiveness on it. This fuming may be done by hanging the tissue in a box at the bottom of which is a dish containing some acetic acid.—*Il Prog. Foto.*, 1915, p. 208.

Collodion Films

M. CHARDONNET, so well known as the manufacturer of artificial cellulosic silks, stated before the French Physical Society that the addition to a collodion of an alkaloid, such as quinine or brucine, or aniline, in the ratio of one three-thousandth of the weight of the dry nitro-cellulose, considerably increased the elasticity without affecting its strength.

He also stated that the thickness of a collodion film is practically proportional to the cube of the concentration in nitro-cellulose of the collodion used. If, for example, a collodion, containing 10 per cent. of nitro-cellulose gave a film weighing 25 g. per square meter, then, under similar conditions, a collodion containing 200 g. per liter would give a film weighing 200 g. per square meter as $25 \times 2^3 = 25 \times 8 = 200$.—*Phot. Rev.*, 1919, p. 156.

Plate Sensitizing

VON HUEBL again deals with the sensitizing of plates by bathing, and in this particular case treats of the addition of ammonia and alcohol to the sensitizing bath.

The addition of alcohol to the sensitizing bath is defended primarily on the ground that it produces rapid drying; for rapid drying is very important, as plates which take some hours in this process are always foggy and flat working. For this reason he recommends the addition of from 20 to 30 per cent. of alcohol to the sensitizing bath.

An alternative to this is the use of alcohol as a rinsing bath; that is to say, after bathing the plates in the usual manner for about three minutes, in an aqueous solution, the plates may be immersed for about a minute, with continuous rocking, in a bath of 90 per cent. alcohol.

The secondary purpose of the alcohol is to keep the dyes in solution, and this von Huebl states to be absolutely essential with some of the isocyanins. He points out that the dyes are in a colloidal state in water, and advances as proof that by passing such solutions through a filter paper most of the dye will be retained on the fiber of the paper or on the sides of the vessels. And the solutions behave in the same way with a gelatin plate, and the dye separates out to a great extent on the surface of the gelatin, and gives rise in developing to fog, spots and wave marks, and it is obvious that, if the dye is thus superficially deposited on the gelatin, the solution that does penetrate must produce lower color sensitizing because of its loss of dye.

The alcohol-containing solutions are, on the other hand, true solutions, which can be filtered and are much more suitable for color sensitizing. But the addition of alcohol must not be too great, as otherwise the sensitiveness suffers.

In order to prove this point, a series of plates were bathed in a solution of pinachrome, with various additions of alcohol, with the following results:

50 per cent. of alcohol . . . v =	7
25 " " " . . v =	23
10 " " " . . v =	23
No alcohol v =	26

Similar results are obtained with ethyl red, pinaverdol, and pinachrome violet, which dyes have a slight tendency to flock out.

It is entirely different with pinacyanol for this gave:

25 per cent. of alcohol . . . v =	33
No alcohol v =	12

With pinachrome blue the figures were:

25 per cent. of alcohol . . . v =	12
50 " " " . . v =	33
No alcohol v =	7

With pinacyanol blue:

50 per cent. of alcohol . . . v =	33
No alcohol v =	3

To test the action of a secondary alcohol bath the following figures were obtained:

Orthochrome aqueous bath . . v =	30
Ditto with alcohol bath . . v =	29

With pinacyanol the results were:

30 per cent. alcohol . . . v =	36
No alcohol with alcohol rinse . . v =	14

With erythrosin the addition of alcohol, whether added to the bath or as a subsequent rinse, was decidedly prejudicial, the sensitiveness being much lowered.

As regards the addition of ammonia, von Huebl points out that it is quite a common belief that many dyes will not sensitize without ammonia; but Koenig has pointed out that, as a rule, it is quite superfluous, and in any considerable quantities is really prejudicial, as it causes fog to rapidly ensue. The isocyanins are extremely sensitive to acids, and therefore, to prevent the effect of acid, about one or two drops of ammonia to 100 c.c. of bath is permissible.

The following figures prove the poor action of ammonia; in the case of orthochrome:

Without ammonia v =	30
With " v =	33

For pinaverdol:

Without ammonia v =	32
With " v =	26

For pinacyanol:

30 per cent. alcohol without ammonia v =	33
30 per cent. alcohol with ammonia v =	32

Instead of ammonia it is far better to add a little borax, about 1 c.c. of a cold saturated solution to 100 c.c. of the bath. This will neutralize any acidity and yet does not induce subsequent fog. In the case of erythrosin, however, ammonia is superior to borax—*Phot. Chron.*, 1920, p. 41.

Namias states that when using such sensitizers as pinachrom or pinacyanol it is extremely difficult to prevent fog, and advises the addition of 0.1 to 0.2 per cent. of boric acid to the sensitizing bath, which, he states, stabilizes the dye and prevents fog, without affecting the color sensitiveness, although the general sensitiveness is slightly lowered.—*Il Prog. Fot.*, 1916, p. 40.

Von Huebl's measurements are based on a particular sensitometric method, about which I know nothing, as his description of the same appeared during the war; but he does state, in a footnote, that they were made to an artificial daylight source and that the unit is the sensitiveness to wave-length 495 in the blue, and that his figures given above represent how much the sensitiveness at that point must be lowered. I have multiplied his unit by 100, to save fractions, and therefore the above figures represent the fraction of the sensitiveness to his white light taken as 100. Von Huebl further states

that a variation of 25 per cent. in the figures is of no moment.

Sheppard, in a very exhaustive paper (*Phot. Journ.*, 1908, p. 300) proves that alcohol has a marked effect in lowering the sensitiveness even with pinacyanol, and, as his curves are based on very close wave-length measurements, one would feel inclined to lay the greater weight on them.

With reference to the "flocking-out" of the isocyanins and their absorption by filter paper, it should be pointed out that it has long been known that these dyes only form true solutions in alcoholic menstrua, and also, being basic dyes, they would naturally be taken up by filter paper, as all basic dyes have a strong affinity for cellulose, while acid dyes have practically none but a great affinity for gelatin.

With reference to Namias' note, it is a little difficult to reconcile with facts. From actual trial I have found that boric acid readily decolorizes both pinachrome and pinacyanol, and, while Koenig has stated that these dyes when decolorized are equally good color sensitizers, this does not jibe with my experience.—E. J. W.

A Bromoil Tip

DR. EMIL MAAYER, the president of the Vienna Amateur Photographic Club and the author of a book on the bromoil process, suggests that the most artistic results in photography are obtainable by breaking up the image into points, so as to obliterate obtrusive detail to some extent, and that soft-focus lenses, chiffon, bolting silk, *et hoc genus omne*, have been used. In the bromoil process these effects can be obtained by the expert by the brush alone—when once

applied—but that a second or more applications spoil the results.

He has now discovered that the desired result can be obtained by spraying the surface of a bromoil, before inking up, with an alkaline solution, a 5 per cent. solution of potassium carbonate, because wherever the solution touches the gelatin it will subsequently swell up more and naturally refuse to take the greasy ink.

The learned doctor's description of how to attain the desired end is given as far as possible in his own words: "The cold swollen and absolutely dried sheet should be placed in a horizontal support, and the atomizer set in action; only when it is working absolutely evenly, should it be allowed to act as evenly as possible on the sheet and always under continuous observation so long until the whole sheet is evenly covered with a system of the finest little drops. The most important premise is the continuous observation of the sheet during the application of the swelling medium, and actually best by acute incident light. The practical arrangement for this is: The sheet should be laid on a table near a window. The worker takes his place opposite the window and brings his eye and the spray diffuser very slightly in front of and above the sheet to be sprayed. There is thus produced in every little drop a light reflection, which facilitates the observation of the system of drops."

The author goes on to describe how one must learn the idiosyncrasies of the spray diffuser, and practice first. After spraying, the sheet must not be touched, but left for a minute or so, the time being dependent on the temperature and the kind of paper and so on and so forth. The longer it is left the coarser the grain. The sheet should then be rinsed and soaked in water and inked up.—*Phot. Rund.*, 1920, p. 17.



The "British Journal" Almanac for 1920

THE standard *British Journal Almanac* for 1920 has again come to hand, and we are surprised at the volume of advertising presented by the British manufacturer. Sandwiched in between these catalogues appears a smaller amount of reading matter, but none the less helpful. The editor writes on "Beginners' Failures in Photography" and there are some useful formulæ. It is a handbook that will be valued and appreciated by every photographer. Geo. Murphy, Inc., 57 E. Ninth Street, New York City, are the American agents.

Labor

THE high cost of living, the high cost of material, has been and is being investigated in towns, cities and States in the entire country. Eventually every report is practically the same, that the high cost is brought about by the increased price of labor. We cannot understand why certain articles double in price in a short time. We don't mean to say there is no profit. In some cases there may be; but you will find upon investigation that the majority of people in business today, whether it is manufacturing, wholesale or retail, are making a smaller per-

centage of profit in many cases than they have ever made before.

It isn't the price of goods considered by many today, it's getting the goods when they want them. For illustration, a person may be able to find someone who will give him a lower price on paper, plates, chemicals, etc., than he can get from the regular supply house, someone who is doing sort of a commission business, getting the orders, then ordering the goods and delivering them when they can get the same. A 10 per cent. discount on \$50 worth of goods only means \$5, and if you yourself or your employees are unable to get work out on time and lose a day or two waiting for supplies, besides disappointing your customers and getting behind in other work that should be done, you have paid in the loss of labor many times more than the amount saved on the goods. Time or labor is the greatest expense today. Anything connected with business which means that we must pay for time which is not used, adds not only to our overhead but makes a big hole in our profits. A telegram may cost 50 cents and a letter may only cost 2 cents, but a telegram will oftentimes bring the goods, which adds to the profit, while the letter will bring the goods too late to be of service.

As we have said before, it isn't the price which you pay for goods, it's your ability to get them when you want them and as you want them. We may pay an enormous price for some little device, but if it saves ten, fifteen or thirty minutes a day of one of our employees, it means at the end of the year that we have made money by purchasing the same. Labor is the one great item of expense, and every moment lost means so much taken from our profits.—*Ohio Photo News*.

The C. P. Goerz American Optical Company

THE German ownership of the C. P. Goerz American Optical Company, consisting of 549 shares of its common stock, out of a total of 600 shares, together with all its photographic patents, trade names, and other valuable concessions, was sold by the Alien Property Custodian on March 5, 1920, to a syndicate of Boston financiers, composed mainly of members of two important banking houses.

The office and factory of the company will continue to be maintained as previously at 317 East Thirty-fourth Street, New York City, and the Company proposes to continue the manufacture of photographic lenses of the highest quality as an American enterprise entirely.

A force of highly skilled workers, together with the same supervising staff of experts, with their many years of practical experience in the making of anastigmat lenses, and under the management of Mr. Fred Schmid, who has been connected with the Company in executive positions for twenty years, will give full assurance that the standard of quality of the celebrated Goerz lenses will be fully maintained.

The demand for Goerz lenses continues to be very strong, and, at the present, facilities of the factory are taxed considerably to meet the urgent demand. The Company has lately succeeded, however, in furnishing the well-known Goerz Dagor, Dogmar and Hypar lenses in fairly good quanti-

ties, and there is every prospect that the volume of production of the many different types of lenses will soon greatly increase.

The prospects for a healthy growth of the Company seem very bright, and we may look forward to an increased activity of the Company in the near future.

Interesting Points of Law

THE copyright of a picture of an article, machine or design of any kind does not prevent another person from making the article. It protects the picture and nothing more. If the copyright of a picture of a machine prevented the making of the machine it would be a patent.

The function of a copyright is to prevent one person from using the work of another. In making books, tables of statistics or maps, a second person can go through the same sources of data and information and independently work out or compile a chart, map or table that will not infringe the first, though it will necessarily resemble it.

So a photographer may take the same scene, building, person or article in similar lighting, weather conditions or pose and it will not be an infringement because he is not using the work done by the other.

The copyright of a book or periodical covers the individual pictures used as illustrations, but if the pictures are also published separately, they should be copyrighted separately.

Registration of Copyright. The registration of copyright is an exceedingly simple process. If a photograph is to be reproduced for sale, all that is necessary is to send two copies of the photograph, with the proper blank (J2) filled in, to the Librarian of Congress, Copyright Office, Washington, D. C.

If the photograph is not to be reproduced for sale, one print with the blank J1 filled in should be mailed to the Copyright Office. In the first case the prints should be sent immediately after publication, the published photograph being properly marked. The proper mark is the word "Copyright" or the abbreviation "Copr." or the letter C within a circle, with the name of the author or proprietor, or his initials or monogram, in which latter case his full name should appear on the back or margin of the print or on the mount. This permits the photographer to make a picture, mark it "Copyrighted," offer it for sale, or allow it to be published at once, provided two prints and properly filled blanks are immediately mailed to the Copyright Office with the necessary fee.

The fee is 50 cents unless a certificate is desired, in which case it is \$1.00. The subject is fully explained in the "Rules and Regulations for the Registration of Claims for Copyright" which with any blanks desired may be obtained by addressing the Register of Copyrights, Library of Congress, Washington, D. C.

Who May Copyright. The law states that an author or proprietor has the right to copyright protection, and that "author" includes the employer in the case of works made for hire. This, translated, means that the man who makes the picture has the right, unless he is paid by someone to make the pictures, in which case the

man who pays for having the work done has the right to have the picture copyrighted.

In any case where there is a possibility of a question arising, it is a wise precaution to have an understanding, and the rights of the parties reduced to writing. You can't expect to be paid for making a picture and retain the right to copyright it and use it as you please and, again, you can't expect to make a picture of a person, free of charge and expect to copyright it and use it for advertising or other purposes if your intent is not understood and permission granted. And if a copyright is taken out by a person *not* having proprietary rights, it is void and cannot be enforced.

Common Law Rights Prior to Publication. It is provided in the Copyright Law that nothing therein shall be construed to annul or limit the right of the author or proprietor of an unpublished work, and the question at once arises as to what these rights are.

If you go to a photographer to have your portrait made and pay him for his work the fact that the photograph has not been copyrighted does not make it public property, and the same applies when you take negatives to a photographer to have prints made. The photographer has no right to make extra prints from your negatives for any purpose. The U. S. Supreme Court has ruled that the property of the author in his unpublished work is absolute until he voluntarily parts with it.

It is difficult to state just what constitutes the publication of a photograph in the eyes of the law. The author may permit others to examine and enjoy his work under such restrictions as he may care to make and he does not publish, but if he puts his work in a public place where anyone may see and enjoy it, he may be said to have published it. Presumably then, the gift of your portrait to a friend would not be publication and would not give anyone the right to use it without your consent.

On the other hand, if you allowed your portrait to appear in public print or to be displayed with other photographs advertising amateur theatricals or for some similar purpose, the courts would probably hold that the picture had been published. The laws of different States might make slightly different rulings necessary depending upon the question involved. We merely want to show that there are common law rights and that these rights do not hold after a picture has been published.

You can be quite certain that if you make a very fine photograph and offer it for sale without its first being copyrighted, you have no protection against the person who may copy your picture and offer his copy for sale.—*Studio Light.*

Photograms for the Year

THIS fine annual of pictorial photography never presented a more representative collection, nor in a more worthy manner. Beautifully

printed and ably edited, the volume contains the best that has been achieved in pictorial photography, and will be an inspiration and help to any art photographer who will be fortunate to possess a copy. Tennant & Ward, 103 Park Avenue, New York City, are the agents.

"Penrose's Annual" for 1920

AFTER a lapse of two years this attractive and welcome annual appears in a bright and beautiful dress.

The illustrations are unusually fine; most of them are in color by various processes. The articles by different authors are concise and give the reader an insight into the various methods of reproduction and also reveal to him the advance that is being made through photographic methods. Tennant & Ward, 103 Park Avenue, New York City, are the American agents.

The Ohio-Michigan-Indiana Convention

THIS year the Ohio-Michigan-Indiana Photographers' Association will hold its annual convention at Cedar Point, Ohio, July 6, 7, 8, 9, 1920. The hotel at that time of the year will not be crowded, and they have the positive assurance of the G. A. Boeckling Company that those attending the convention will be amply provided for in every way.

This will be an educational convention. It is expected that there will be a large exhibit of photographs that sell for real money. There will be a limited number of prizes, there being a Pictorial Class open to the world, and a Studio Portrait Class, Home Portrait Class and Commercial Class from Ohio, Michigan and Indiana photographers; also a Complimentary exhibit. From all pictures exhibited, including the Complimentary exhibit, a selection will be made for the Interstate Trophy. This Interstate Trophy is, of itself, of sufficient importance for getting out a large representative exhibit.

The Studio and Home Portrait Classes are to be from negatives from which photographs have been sold as portraits in the regular course of business, and the prints exhibited must be finished exactly as delivered to customer, including mount and folder, or frame.

The talks and demonstrations will be along practical lines, the kind that will be helpful for everyday work in the studio. There are to be talks on business getting, salesmanship, and demonstrations on flash- and electric-light operating. They hope to have an artist who will talk on art as applied to photography, and will also be free to criticise the work from an artistic standpoint.

There is no place in the country where entertainment features can be put on as well as at Cedar Point. There will be water sports, a masquerade ball, a beach party, a banquet and a real minstrel show.

Plan now to attend the O-M-I Convention at Cedar Point.—*Abel's Weekly.*



ROSE

The WORKROOM

GONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

- The Preparation and Renovation of Backgrounds
- A Hint for Background Workers
- Photographing Graves
- Facts and Figures from a Note Book
- Toward the Light
- Underexposure
- The Reduction of Negatives and Prints
- Lantern Slides and the Enlarger
- Why Mounted Prints "Come Up"
- Copying in Black and White
- Notes for Double-transfer Carbon
- A Stunt Worth Knowing
- Milky Fixing-baths
- Dry Plate Don'ts
- Relief Photography
- Useful Hints for the Line Operator and Etcher
- Packing Negatives for Shipment
- The Process of Photo-Zincography
- The Copying of Photographic Prints
- Keeping Chemicals
- The Iron Developer for Black and Sulphide-Toned Bromide Prints
- Bromide Toning Processes
- Photographic Materials and Processes



THE WORKROOM

By the Head Operator

The Preparation and Renovation of Backgrounds

THERE are few photographers who have not at some time or other felt a desire to paint a background, but of those who have essayed the task only a small proportion have felt satisfied with the result. In the majority of cases this is due to the use of improper materials and tools, and in others to ignorance of the proper methods of mixing and employing them.

The materials usually employed as the basis of backgrounds are stout unbleached sheeting and scene painter's canvas. The former is cheap and good enough for all ordinary purposes, while the latter is more expensive and at the same time more durable and of a better substance, being much less liable to accidental punctures with head-rest or the corners of accessories. Our first requirement is a frame on which the material may be strained for painting; if none of suitable size exists in the studio, one should be made of stout "slate battens," which may be bought very cheaply at any timber yard. They should be "halved" at the corners so that the frame has a flush surface, and fastened together with quarter-inch bolts and nuts. The former should have flat heads; these cost about three halfpence each, and four are needed. In order to keep the frame square, a couple of stretchers should be nailed on to the back, diagonally across two opposite corners. These are best fixed on with wire nails, so that they can be easily removed when the frame is to be taken to pieces. It is advisable to procure the sheeting before making this frame, as sometimes the width is barely as wide as it is supposed to be, and make-shift methods of stretching have to be adopted. The fabric should be brought over the edge of the frame, and fastened with ordinary tin tacks, taking care not to drive these quite home, so that they may be easily pulled out with pincers when the work is completed. The object of putting the nails on the edge of the frame instead of on the flat is to provide a smooth surface to the extreme edge of the frame, so that the brush will not catch on the tacks. Whether the medium to be employed be distemper or oil color, it is always desirable to size the canvas well first, and in the case of oil it is absolutely necessary. This is done by giving a coat either of warm size, such as is used by paperhangers, or one of starch paste, as made for mounting. This may be applied with an ordinary distemper brush, and must be well rubbed into the material and allowed to dry. While this is going on the distemper may be mixed or, better still, it should have been made at the commencement of the job, as it works smoother after having been mixed a few days.

The popular idea of mixing size color is to

start with a lot of white and to attempt to bring it to the proper tint by adding the black or brown pigment, but for backgrounds, at all events, it is better to take the dark color first and to add the white to it until the desired tint is obtained. If scenic or clouded backgrounds are to be made, it is a good plan to mix the black or brown and the white separately, and to make the intermediate shades from them in separate pots or basins. Small quantities can be mixed on a piece of board, which serves also as a palette. The color may be mixed in any deep basin or small pail. It is advisable to mix the powder color to a creamy consistency with cold water, and when all lumps are broken up to add enough hot size to make it as thick as ordinary oil paint. When cold it should form a thin jelly, which can readily be spread with the brush without going into lumps. If possible, the paint should be squeezed through muslin or rubbed through a hair sieve; this will prevent streaks in the coating, caused by undissolved particles of color.

It must always be remembered that size color is many shades darker when wet than when dry, so that it will be necessary to place a dab from each pot of color upon a piece of brown paper, and to dry them thoroughly, before commencing the painting. This rough "color chart" will show the value of each touch on the finished background. A common mistake is to make the color too thin, for if this is the case it will be found impossible to secure freedom from streaks, besides being very messy and unpleasant to use. If the paint shows the slightest tendency to run when applied freely to the canvas it will be necessary to add more strong size to it and to allow it to cool. A little melted glue is very useful, as it stiffens the color without further diluting it.

Good brushes are essential to successful work, as there is nothing so annoying as to have to keep stopping work to remove loose bristles, while a harsh stiff brush which has perhaps been used for oil paint will inevitably produce a rough scratchy effect, not perhaps harmful from the photographic point of view, but not by any means workmanlike in appearance. Perfectly plain backgrounds can be covered by means of an ordinary flat distemper brush, such as is used for walls and ceilings, but for clouds or scenic work round brushes are much better. One about two and a half inches in diameter will be as large as is necessary, with one or two "sash tools" for smaller details; for straight lines, as in doors or windows, large hog tools are useful, as they are somewhat firmer in their touch. These are used in conjunction with a long ruler made of a strip of wood about three inches wide and a half-inch thick.

No useful purpose is served by giving the
(193)

whole surface a coat of the lightest tint and then working the darker portions over it; on the contrary, it is better to sketch out the effects in faint outline, say, in blue chalk, and to work up to full strength in each part at the first painting. By so doing there will only be one thickness of color on the canvas, and there will be no tendency for it to flake off when the background is rolled up. As a general rule, the texture of the sheeting should only just be lost when the background is dry, and the surface should feel decidedly rough to the hand. If it feels smooth and the cloth is quite stiff, it means either that the color has been laid on too thickly or that too much size has been used. The novice will do well to confine his first attempts to some clouded head-grounds about 54 inches square. These will be more easily managed, and if unsuccessful will not be so disappointing as would one of the full size (8 feet square).

The materials used for the distemper are, for gray tones, ordinary whiting and lampblack, with a trace of Venetian red to give a little warmth; the red takes off the cold slaty tint and gives a better effect in the negative. For browns, whiting and burnt umber for warm tones, with a little lampblack added for colder ones. For white "sketch" grounds, whiting, with ordinary laundry blue squeezed in to the mixed color till the mass is of a fairly bright blue. This will dry to a bluish white. For the darkest shades the black or brown should be used without any admixture of white. Vegetable black may be used instead of lampblack; it is easier to mix, but has not the same depth.

Oil colors are now seldom used for background painting, possibly on account of the extra time necessary to apply them and their greater cost. The chief difficulty with them is to avoid gloss. It is almost impossible to do this when using ready mixed paints. The right way to get to work is to go to a good colorman and to ask for the necessary color, say, burnt umber or black, "ground in oil." This should be in a thick paste, which is reduced to a workable consistency with turpentine alone. A little should be tried upon a piece of sized wood, and if it cannot be rubbed off when dry it is fit to use; if powdery, a little raw linseed oil may be added to the turpentine, and another trial made. When there is no gloss, and yet the color is fast, then the paint is in good condition. It is hardly necessary to say that, in all cases, the sheeting or canvas must be well sized before coating with oil paint. The great advantages of oil-painted grounds are durability and the fact that the true effect can be judged while actually painting without waiting for the work to dry. Alterations may also be made at any time without making the work look patchy.

A method which is periodically referred to is the dry or pastel process of making backgrounds, invented by Robert Faulkner. In this, powder colors are used, the umber, black, or white being mixed with dextrine and dusted upon a damp canvas, into which they are scrubbed with an ordinary clothes brush. It is, of course, only possible to get very "soft" effects in this way, and I fancy the process is more talked about than practised.

Sketch backgrounds may easily be made from

continuous cartridge paper, the desired design being put in with shoe-maker's heelball. As this is rather hard, it is necessary to work upon a smooth table to avoid damaging the paper. Conté crayons are easier to use, but are liable to smear, which the heelball is not.

When attempting to paint a scenic background, it is always desirable to make a small sketch, say, of cabinet size, and to test the effect with a figure or two cut out from ordinary prints. This will ensure the correct disposition of light and shade. This sketch should then be ruled over into one-inch squares, and the background ruled with the same number of squares on a larger scale. Thus with an 8-inch sketch the squares will have to be 12 inches wide on an 8 foot background. The lines may be made in chalk or pencil, and are covered up by the painting. The idea is to facilitate the placing of the sketch upon the canvas, as the portion contained in each little square is drawn in on the corresponding square on the canvas. Another plan is to make a negative of the sketch, and to project it upon the canvas by means of an enlarging lantern and lightly drawing in the outlines in chalk or pencil.

Old backgrounds are treated in the same way as new ones, and some very hard and obtrusive specimens may be greatly improved by giving a coat of thin color all over, and allowing the subject to show through. I once cured a very aggressive conservatory ground by this treatment. Before you saw the background instead of the sitter, afterward it gave a mere sketchy suggestion. Torn or damaged grounds should be patched at the back with a piece of sheeting glued on and a piece of tough thin paper over the rent on the face; this will be quite invisible when worked over.

Many of the ready-made distempers or water paints are available for background work, although they do not handle so nicely as good size colors. If such be used, care must be taken not to make them too thin, or they will run all over the place.

Above all, when painting a scenic background, remember that it is only an accessory to the picture. If the background itself is a success as a picture, it will almost certainly be a failure in its proper position. Aim at simplicity and breadth, and take your ideas from the works of the great painters rather than from the dealers' lists.—B. J.

A Hint for Background Workers

HAVE you ever noticed how difficult it is to get a really good point to your india rubber when picking out high-lights or the cloudy effects in sketch background and pencil point work? You will find the blacklead rubs off into the point of the rubber, and necessitating continually cleaning the point. Even then one is apt to spoil the effect, because of the black smudge made by the soiled and ragged end. I find, however, Windsor and Newton's kneaded rubber to be a splendid remedy for this trouble, since you can make it any shape you wish—either a good solid piece, a thin point, or a flat edge. Then, again, if you just alter the shape, after

using it for two or three strokes it cleans the point, and you will not have any bother about dirty marks.

I usually cut it into three portions, as then you can insure cleanliness, and also it is more economical. If by leaving it exposed to the air it gets very hard and difficult to twist and turn as you want it, try holding it in front of the fire for a few minutes, and work it up in your hands a little, and you will find it will become quite pliable again.—*B. J.*

Photographing Graves

MANY people desire to have the grave of a departed relative photographed with the wreaths displayed—that is, soon after the funeral ceremony. In this work it always pays to take pains to do it well, and especially to get the proof print submitted quickly, for sometimes relatives who have sent a wreath will like to have a copy, yet a very little time elapses before their keen interest evaporates. It may seem cynical, but it is a fact none the less. Also, if the picture of the wreaths turns out well, an order for a representation of the gravestone will very likely follow in due course.

The work is not so simple that a few hints may not be welcome as to the best ways of satisfying the customer. The best plate to use is undoubtedly one of the new type of "non-filter," as the subject can seldom be managed with a filter in the lens owing to the movement caused by wind, especially of the maidenhair fern, which is used so largely in wreaths. Should the wind prevent a sufficiently long exposure for the small stop needed, it can be given in installments by watching for a lull, when the quivering flowers and leaves remain still for an instant; but this operation needs great care to avoid vibration of the camera. In the absence of a portrait shutter, which is best for intermittent exposures of this kind, a good substitute can be made by relaxing the spring of an ordinary roller-blind T-I shutter and exposing by gently pulling and releasing the cord. Several short periods can be given to make up the required exposure if care be taken.

It is best to use a fairly long focus lens to avoid disproportion of size between various wreaths; a fairly high stand will enable one to fill the plate well, especially if a little time is spent first of all in propping up and otherwise arranging the wreaths to their best advantage, but at the same time they must not be "posed" too obviously. The long-focus lens also enables one to get the surrounding ground well diffused. It is well to take a view from each of two opposite corners, and many people will be extra pleased if they can see the writing on the card of their particular wreath, even if it takes a strong magnifying glass to read it.

Much the same remarks apply to photographing the grave when the stone has been set up. It is not always possible to get far enough away to avoid some little exaggeration of perspective, but the essential point is that the lettering should be clear, and to this end careful choice of the time when the light is shining diagonally on to the stone and a fairly slow plate are the principal means.—*B. J.*

Facts and Figures from a Note Book

PINHOLES in the blinds of focal-plane or roller-blind shutters may be eliminated by mixing up lampblack and rubber solution (as used for cycle tires). Mix to a paste and rub well in. The blind should be left exposed to the atmosphere as long as possible, and should be dusted over with French chalk before being wound.

Plates backed in the dark-room frequently suffer from spots of backing on the face of the plate. This can be avoided by backing plates in pairs, as they come from the box. This also gives a little protection from any stray light during drying.

It is sometimes necessary to cut down plates, either to make an unusual size or to replace a run-out stock of a standard size. Plates cut down in this way are often spoilt by small particles of glass getting on to the emulsion and grinding in, causing much work for the spotter. All this is avoided with a little care. Firstly, use a cutting guide, and make every cut a clean one. It is easy to do this with either a diamond or a wheel cutter if the correct angle for use is found. Cut the plates without separating the pairs as they come from the box; do not separate them until they are required for use, and then as soon as the unwanted portion is broken off give the plate a sharp tap on the edge of a bench, holding it in a vertical position when so doing. When cut plates have to be repacked, do not break them, but leave them in pairs complete; it is easy to snap them off when required.

There are two classes of originals which a photographer is often asked to copy that may be very greatly improved before the copying process is begun. First, there is the dirty and cracked albumen or gelatin print. The best method of preparing this is as follows: First rub carefully over with stale breadcrumbs (this is safer and more effective than rubber). Work off all the dirt you can in this way and then soak the print in glycerin. When well soaked a lot more dirt may be worked off with the finger-tips. When the print is as clean as it is possible to make it, it is ready to copy. If the cracks are very bad it is best not to dry the print, but while it is still wet with the glycerin squeeze it into contact with a thin clear glass. The cracks will be very obvious, but may be made almost invisible by squeegeeing a piece of white paper into the still wet back of the print. The copy is made through the glass, and though the glycerin takes a long time to dry it is best to finish as quickly as possible.

This method is perfectly safe, and may be used on any original, but the next should only be used when permission can be obtained, for, although it is, as a rule, perfectly safe, it may very occasionally ruin an original. When a print (non-photographic) or etching has to be copied and the paper base is discolored through age or bad storage it can be very much improved by an immersion in a weak solution of ordinary bleaching powder in water, about $\frac{1}{2}$ ounce of fresh bleaching powder to a pint of water is about right. In bad cases a few drops of hydrochloric acid added to the above will hasten the cleaning up. The solution must be washed well out of the print after use. This is a fairly safe

method with any ink image, but is useless for photographic originals.

Some photographers, especially those who travel and those whose dark-rooms are not heated, may be glad to hear of a developer practically uninfluenced by changes in temperature. This is pyrocatechin, a very useful all-round developer.

P. O. P. is not the popular process that it was at one time, but there is still an enormous quantity of it used. It is not uncommon to find a P. O. P. very much overprinted. It is sometimes inconvenient to make another print, and it is not necessary as there are several reduction processes which will give excellent results.

To my mind the best results are obtained by fixing the untoned print in a strong hypo bath, and then toning with soda sulphide. The print may be placed in this direct, or it may be bleached first, as is usual with bromide prints. This method gives very great reduction. A slight reduction may be often effected by leaving the toned print in a strong hypo bath for an hour or so.

In pre-war days the black tones obtained on C. C. paper by the platinum-toning method were much admired. Platinum is now at such a high price that its use is almost barred, but much the same tones may be obtained by adding a little chloride of lime to the usual P. O. P. toning bath. There is some doubt as to the permanence of prints so made, but I have seen prints toned by this method ten years ago, and they are still as fresh as on the day they were made.—*B. J.*

Toward the Light

MANY excellent effects in bust and half-length portraits are to be obtained by taking a three-quarter face view, the camera being placed on the shadow side. There is, however, very frequently a tendency to hardness in such pictures, the high-lights being too dense and lacking in flesh texture. To a certain extent this may be due to overdevelopment, but we think more often to overlighting. If a screen of butter muslin or similar thin material be placed near the head to soften the direct light a great improvement will be evident in the lighting, and that without lengthening the exposure. When taking such strongly-lighted subjects it is a good plan to open a blind at the camera end of the studio, as this will illuminate the shadow side softly without destroying the modelling, as a reflector often does. If the effect is at first not quite satisfactory it is better to alter the position of the head and the camera in preference to touching the blinds. The method we advocate has the advantage that the sitter may be brought nearer the light, whether day or artificial, with a consequent reduction in exposure.—*B. J.*

Underexposure

IN spite of the progressive increase in the sensitiveness of plates there is still probably no more common error in portrait work than that of giving insufficient exposure. No matter what facilities are offered to him in the shape of rapid lenses or super-sensitive emulsions the average

operator employs them, not to improve the quality of his work, but to reduce still further the time of exposure. On looking over a few old wet-collodion negatives recently we could not help noticing that they were much better "covered" than are the majority of present-day exposures; that is to say, that the areas of deep shadow in them were very small compared with the average modern negative. It must, of course, be understood that we are speaking of the same class of work in each case, ordinary "three-quarter" lighted figures, and not of negatives made for special effects where broad masses of light and shade are sought for, as it would be foolish to set up a uniform standard of quality in negatives and expect all varieties of work to conform to it. Departure from rules and traditions as to lighting and quality of negatives has undoubtedly made for the artistic development of photography, and to those who are capable of taking their own line we have nothing to say on this point, but there are many whose ambitions do not go beyond good everyday work, and whose desire is to produce portraits which, to quote an old newspaper notice, are "soft, brilliant and full of life." The first two qualities may appear to some to be incompatible, but they may be combined if due attention be given to exposure and development. This can only be done by thoroughly mastering the qualities of the plate it is intended to use by experiment and observation, as not only do the plates of different makers behave very differently but different grades of the same make exhibit widely different characteristics. One well known plate enjoys great popularity because it develops up to printing density quickly, and therefore gives the idea that the exposure has been adequate, but upon examination the negatives will often be found hard and poor in shadow detail. A faster grade of the same make takes rather longer to appear and consequently to develop to the same density, with the result that it is accused of giving flat images.

We are afraid that there is still existent in many quarters the old heresy that thin negatives mean the best results in bromide printing, an idea which has been, and is, disastrous to the quality of negative and print alike. This is proved by the fact that makers are forced to bring out "hard" or "contrasty" papers to keep pace with the declining density of the plates; a better way would be first to secure a good negative and then to choose a paper to suit it.

Careful development is necessary, no matter what plate is used or what exposure given, and we strongly recommend study of the factorial system to the operator who finds that any considerable proportion of his negatives require after-treatment in the way of intensification or reduction. By the use of this system, which after a time may be almost subconscious, it is easy to secure negatives which are uniform in density, and being based entirely upon time the common errors of overdeveloping underexposed plates and underdeveloping overexposed ones are entirely avoided, as is also that of mistaking a slight surface fog over the shadows for over-exposure.

At the present season it is certainly not easy to

secure brilliant negatives in large towns, but the difficulty is aggravated rather than reduced by shortening the exposure. With a fuller exposure the high-lights will attain greater relative density in relation to the shadows, when compared with those which have not received enough exposure to give a sufficiently dense image, no matter how far the development be carried.

In attempting to alter the quality of one's negatives haphazard variations should not be made in ordinary practice; that is to say, that the fullest benefit cannot be obtained by deciding to give a little more exposure. What should be done is to find out how much more exposure will give the best result, and this can only be done by making trial exposures of varying lengths upon the errand boy or the receptionist and developing in the usual way. It was a maxim of the late William Bedford, a master of technic, that to get perfect negatives the exposure should be suited to the development and not *vice versa*. It is an economical and convenient plan to devise some arrangement for giving several exposures upon one plate so that all may receive equal development. It may not be known to many young photographers that exposures in the ratios of 1, 2, 4 and 8 may be made and developed in this way, and that all four will yield images of practical printing value, although the density of each, of course, is different; probably 1, 2, 3 and 4 would be a more useful series for the purpose we have outlined.—*B. J.*

The Reduction of Negatives and Prints

ALTHOUGH almost as necessary a process as intensification, the reduction of photographic images, either negative or positive, is not usually carried out with equal success, even the simplest methods being regarded as risky by many operators. There is no good reason for this idea, for with ordinary care there is no danger either of destroying the image or staining the film.

Nearly all non-mechanical methods of reduction consist in converting a portion of the metallic silver image into a soluble salt which can be removed by a "fixing" agent such as cyanide of potassium or more commonly hypo, the outstanding exception being the persulphate method, in which a silver salt soluble in water is formed.

The process of reduction, like that of intensification, may be carried out in either one or two stages, the latter being the earlier form, the soluble salt being formed by immersion of the negative in one solution while the removal was effected in another. As examples of this, I may give a preliminary bath of perchloride of iron or of diluted tincture of iodine followed by a plain solution of hyposulphite of soda. This procedure was effective in its way, but had the disadvantage of not being under control, as it was difficult to judge of the amount of reduction until the negative was removed from the hypo bath. It was therefore a great advance when Mr. Howard Farmer introduced the ferricyanide and hypo reducer, in which the conversion of the silver into a soluble form and its solution took place simultaneously, thereby permitting any desired degree of reduction to be obtained.

It should be noted that in the case of nearly all reducing solutions the degree of concentration has a marked effect upon the result, a strong solution dissolving the more delicate half-tones away entirely before any perceptible effect is made upon the high-lights, while a weak solution has a more even effect all over the image. This may be taken advantage of, as it allows of fog being quickly removed by a strong solution if it be desired to do so before intensification.

Most of the troubles which occur in reduction may be avoided if ordinary care be exercised in preparing and using the solutions, and I therefore give clear instructions which, if followed, will help to avoid stains and uneven action.

The ferricyanide and hypo or Farmer's reducer is the most generally useful, as its action is easily controlled, and there is no difficulty in its preparation. Where it is in constant use the best plan is to have two stock bottles, one containing a plain hypo solution containing three ounces of hypo to the pint, and the other a 10 per cent. solution of potass. ferricyanide. These are mixed for use in such proportions as may be needed, the color being a good guide. Thus, if we take, say, two ounces of hypo solution and add to this enough ferricyanide solution to give a pale lemon yellow, the action will be slow, but even—that is to say, that the high-lights will be reduced in the same proportion as the shadow details or any fog which may be upon the deep shadows. A large proportion of ferricyanide, giving a deep golden yellow, acts very quickly and will clear fog off the deep shadows of a negative before it has time to penetrate into the film sufficiently to affect the image to any appreciable extent. This property is very useful when dealing with overexposed and overdeveloped negatives, such as are occasionally met with in tank development. It is a good plan, and economical of chemicals, to apply the strong solution with a swab of cotton wool, of course keeping the latter in constant motion. This also allows of a little local action, so that a white skirt or bodice may be reduced without unduly affecting the face, hands, or other draperies.

There are a few precautions which must be taken to make sure of clean working. The hypo solution must be clean and fresh, and an acid fixing-bath must not be used. A weak hypo solution must not be used, as this tends to give yellow stains. I have seen it recommended in some text-books to take a couple of ounces of water, to add to this a few drops of fixing-bath and a few drops of ferricyanide solution to make the reducer. Such a proceeding leads to an unjust condemnation of the method as useless. The mixed solutions must not be used in a strong light, as the ferricyanide is rapidly decomposed, the solution first bleaching and then turning a pale blue. Some workers prefer to dissolve the crystals of ferricyanide directly in the hypo solution. This is equally effective with using a 10-per cent. solution, but is a little more trouble, as the mixed reducer will only keep active for a very short time.

If through disregard of the foregoing precautions yellow stains occur, they may generally be removed either by the iodine and cyanide

reducer or by a weak solution of potassium cyanide.

While the "Farmer" reducer tends to give increased contrast, the persulphate reducer has an opposite tendency, and will so alter the character of a harsh underexposed and over-developed negative that quite soft prints may be obtained. It is very simple in action, but, curiously enough, I have found more people make a mess of its use than almost any other process in negative-making. Flat overexposed negatives are not suitable for this method, no matter how dense they may be. The type that it is especially useful for is a sitter in dark clothes, where there has been considerable underexposure, and the hands and face over-developed in an attempt to secure detail in the shadows.

We require two solutions, both of which should be freshly made. One is ten grains of ammonium persulphate to each ounce of water. This I usually mix in the dish immediately before use. The other is a 5-per cent. or, even better, a 10-per cent. solution of sodium sulphite, which is kept in a dish ready for immediate use. The negative must be perfectly free from hypo, and should be well soaked in water before reducing it if it has been allowed to dry after fixing and washing. It is then immersed in the persulphate solution. The action may commence at once, or it may be ten minutes before any action is visible, which, if the solution be made with tap water, is manifested by a milky appearance. As soon as this is noticed the negative must be constantly watched, as reduction then proceeds rapidly, and it is easy to overdo it. As soon as the desired point is reached the negative is quickly rinsed under the tap and transferred to the sulphite solution, in which it should remain at least ten minutes, after which it should be well washed.

Some samples of persulphate will not attack the image at all until slightly acidified. If no action is visible after ten minutes' immersion, remove the negative from the solution and drop in a very small quantity of dilute sulphuric acid (one part acid to nine parts water). Ten minims of this is ample for two ounces of the persulphate solution. If too much be added, the action will be very rapid and uneven, the image going to a pinkish ghost before the action can be stopped. If the negative has been handled with fingers contaminated with hypo, any portions which have been touched will refuse to reduce or, at all events, hang back behind the clean portions.

A very clean and useful reducer is that composed of iodine and cyanide of potassium. The action of this is very similar to that of the "Farmer" reducer, but as it is extremely poisonous, it is not so generally used. I have, however, found it so useful upon stained negatives and prints that I give details of its preparation and use for those who are careful not to leave cyanide about loose. This caution may seem superfluous, but when I say that I have seen a girl using a 5-per cent. solution of cyanide from an ordinary teacup which a few minutes before had been used for its legitimate purpose, it is not so in all cases.

Two stock solutions which will keep indefinitely are made thus:

A	
Potass iodide.	150 gr.
Water	2 dr.
Iodine (in flakes)	45 gr.
(Stir till dissolved and make up to 1 oz. with water.)	

B	
Potass cyanide.	1 oz.
Water to	10 oz.

For use, take for average work 30 minims of A and 5 minims of B to each ounce of solution. It may be used much stronger or weaker, to suit special cases. I have found this reducer very useful for cleaning green fog off negatives, and also for removing the muddy appearance caused by the forced development of bromide prints. I prefer this reducer before all others for lantern slides or other transparencies, as it does not alter the color of the image in the slightest degree.

Both this reducer and the ferricyanide and hypo are suitable for bromide and gas-light prints but I have not found it desirable to immerse the prints in the solution. A better way is to lay the print on a glass plate or the bottom of an inverted porcelain dish and to swab the solution over with cotton wool, occasionally rinsing under the tap. Stained margins may be cleaned and faulty vignettes corrected very easily.

There is another way of using iodine for reducing bromides which may be referred to, as it affords a means of brightening up a flat print. It is to take, say, a dram of the iodine solution (A) in ten ounces of water and to immerse the print until the high-lights begin to turn blue. The back of the paper quickly turns blue, but no notice must be taken of this. The print is then rinsed and transferred to a plain hypo bath (3 ozs. to the pint), in which it should be left for five minutes. If the reduction is insufficient, the process may be repeated, taking care to wash out all traces of hypo thoroughly beforehand.

I have found no really satisfactory way of reducing P. O. P. prints without altering their color. On the whole, a very weak solution of cyanide seems the most satisfactory. A dram of 10-per-cent. solution in a quart of water is quite strong enough, and with some papers this might be diluted to one-half strength. The reduction should take place slowly or the half-tones will entirely disappear.—B. J.

Lantern Slides and the Enlarger

In our articles on Copying we have shown how the apparatus may be used for a form of copying, namely, the making of lantern-slides by the camera, a negative being copied on to a lantern-plate by transmitted light. While we prefer this method of producing "quality" slides to any other, the ordinary condenser enlarging apparatus, provided ground glass is used between the lamp and the condenser, will enable one to make good slides very rapidly. But it should be noted that this method employs the apparatus as a *reducer*, not as an *enlarger*, and that the conjugates are therefore reversed in position; that is, the longer conjugate is from negative to lens, and the shorter from lens to easel. In enlarging with a 10-inch lens, the distance from lens to

negative will only be $17\frac{1}{2}$ inches when half-plate is being enlarged to whole-plate, while the distance from lens to easel will be $23\frac{1}{2}$ inches. But while an extension of, say, 18 inches will thus enable most *enlarging* work to be done, much more is needed for reductions. Half-plate to lantern-slide means half-size, and the distances would be lens to negative 30 inches, and lens to easel 15 inches. Few enlargers provide for such extension, though they might be made to do so at little extra cost. A lens of shorter focus might be used, but this would necessitate cutting a hole in the easel and focussing on a ground glass, which the plate would replace for exposure. Such a method has its disadvantages in that it upsets ordinary enlarging conditions in many cases, and, further, does not facilitate the placing of the image on the lantern-plate. Where the plate simply rests on three blanket-pins stuck into the easel, focussing and "placing" of the image may be done on a waste plate covered with a piece of thin smooth white paper, this focussing screen being moved into position before the pins are put in. The use of a short focus lens renders the distance between lens and easel too small to work conveniently in this way; hence our point, that ample extension is desirable in the enlarger used for all-round business purposes.—B. J.

Why Mounted Prints "Come Up"

WHAT photographer has not felt a wave of resentment and disgust when a number of what were believed to be nicely-mounted prints begin to lift at the edges, calling for the tedious and often unsightly remedy of passing a paste-brush under the unstuck parts and rubbing them down again? This is one of the many reasons why dry-mounting has become so popular, but even with that the same trouble occasionally crops up, though more rarely.

It is thought that a brief consideration of the factors which aid complete and permanent adhesion between print and mount, compared with those that militate against it, may be useful.

Mounts of a greasy surface are unusual nowadays, but cannot be altogether dismissed. These sometimes make wet prints refuse to stick, but do not generally repel adhesive tissue. Greasy prints are seldom thought of, yet it is evident that the frequent handling a print undergoes during examination in the frame, trimming, and other manipulations may very well lead to greasy or, at least, repellent edges where fingers are not kept perfectly clean, or where the worker has a habit of running them through his hair. A puzzling case of prints lifting at the edges which for a time defied solution was finally traced to newspaper backing of an oily nature in the frames.

In pursuit of more common causes, mounting with starch will be dealt with first, as this is still perhaps the most used, although old-fashioned and fast being ousted. Here, as with other wet mountants, adhesion is partially due at the commencement to what may unscientifically be called suction, in reality atmospheric pressure, the full power of the adhesive not being exerted till it dries. Hence the worker is apt to feel a misleading security when actually

using starch that is too weak or thin, since the prints seem to hold all right when rubbed down. As they dry, however, the air gets in between print and mount at the most accessible parts—namely, the edges, and lifting begins, helped by contraction.

The starch should be obtained from a photographic dealer, for many of the laundry starches now sold are poor or adulterated. Mounts of a too absorbent kind should be avoided. Pasting prints in a pile is doubtless a labor-saving necessity, but is certainly to be deprecated, as it is difficult to expel the water right to the edges owing to capillarity. On no account should smaller prints be laid on top of the pile, for this prevents uniform squeegeeing away of the surplus water. The usual practice is to begin pasting in the middle, but it is better to do the edges first, then to paste all over, rubbing well in, and, lastly, to go again round the edges. Extracting lumps or specks with a knife or the finger needs caution, the mountant being thus often removed. Such an occurrence should be watched for, and the part again touched with the brush. Lifting the print by the edges should be avoided for a similar reason.

A further point to bear in mind is not to make more starch at a time than is required. The adhesiveness of plain starch deteriorates much more quickly than many imagine, sometimes in a day, although putrefaction may be absent. A drop or two of oil of cloves is a useful preservative, and will prevent a future musty smell, but it is not recommended to keep starch paste even with this addition. The methylated spirit often advised in starch recipes is simply a preventive of cockling, though to some extent antiseptic.

Thick mountants of the Higgins type are far better than starch, and when properly applied never give trouble. They lose in tenacity, however, by uneven dilution. Hence it is desirable that the prints should either be dry or but slightly moist. With dry prints smartness is essential in applying the mountant and in rubbing down, or it may partially dry on the print before adhesion is attained, and such portions will obviously "come up."

Gelatin solution is a very tricky mountant, and comparatively few make a success of it, though the results are excellent in careful hands. In mounting a large batch, especially in cold weather, it frequently happens that the vessel containing the gelatin solution is allowed to cool unduly. Contact with the wet print further chills the gelatin, which may consequently be almost filmed over before reaching the mount, the adhesion, therefore, leaving much to be desired. Gelatin solution needs to be kept at a constant temperature during use, and the room should be adequately warmed. Hard gelatin must never be employed, only soft; too thin a solution must be avoided; and, as with starch, it is not good policy to save any that is left over. It can certainly be done by adding a preservative, but repeated melting gradually detracts from the adhesive property—at least, that is the writer's experience.

Dextrine is a tenacious and singularly permanent mountant, as anyone can testify who has

noticed how determinedly old postage stamps resist removal. But the best white dextrine only should be used, the cheaper kinds being markedly inferior. It keeps well, which some may consider a merit.

Lastly, we come to dry-mounting with adhesive tissue, the most up-to-date and cleanly method, and the only one which absolutely abolishes cockling or curving. The chief pitfall here is the use of bad material. The best advice is to keep to one of the recognized brands, for latterly a good deal of tissue has been sold which varies in adhesive power, possibly by the employment of inferior lac. It may be noted that the best freshly-bleached shellac is called for, which has to be kept from exposure to air, or under water, till wanted, otherwise it oxidizes and becomes insoluble. Whether this insolubility also implies infusibility is not clear; but, if so, it is probable that the prepared tissue itself needs to be kept from the air to avoid deterioration. This is readily done by wrapping it up and placing under pressure in a closed box. The idea appears to find corroboration from the fact that complaints are seldom made by small users of tissue, but rather by those who buy it in bulk and, presumably, do not store it well. In mounting, care is required to ensure an even temperature; also the pressure should be uniform, adequate, and not too hastily removed. Quick cooling is desirable, hence the prints should not be laid on a pile as mounted, which may easily lead to resoftening of the tissue. Several obscure instances of dry-mounted prints blistering or "coming up" were tracked down solely to the last-mentioned cause.—A. LOCKETT, in *B. J.*

Copying in Black and White

ON several previous occasions practical instructions have been given in the pages of this journal relating to the process of copying by means of the camera. These have been generally concerned with the methods of copying a color picture, or one containing half-tones such as an ordinary photograph—methods now fairly well understood by most amateurs; but the phase of copying that appears at first sight to be the easiest is the one that apparently most photographers find greatest difficulty with. We refer to subjects in black and white: that is to say, pictures or letterpress that are represented entirely by black lines or solid masses on a white base, without any half-tones at all.

To take a concrete example: and no better example can be suggested than a page of letterpress in black ink on white paper, say, for instance, a boldly printed page containing type lettering only, such as may be found among the advertisements in this journal. We are inclined to think that not one in a hundred readers could take the page in question and make a photographic reproduction of it on white bromide paper that, except for the different surface texture of the paper, would be indistinguishable from it, so far as the black-and-white rendering was concerned. The same doubt applies in the production of a lantern slide reproduction of such a page. Yet it is a task that is really easy of achievement if set about in the proper way;

and the same instructions would apply to the facsimile reproduction in black and white of engravings, etchings, and pen-and-ink drawings.

The secret of success in copying a black-and-white subject is in the choice of a suitable slow well-backed plate that will readily give considerable density; giving an exposure that in no circumstances errs on the side of overexposure; and using a developer that is not only well restrained, but is both clean-working and capable of giving considerable density without fog.

In practice, it will be found that a plate which is usually described in the plate-makers' lists as "photomechanical" is best for the purpose. This is a plate with a very slow emulsion, generally about H. and D. 10, approximately the same as that of a lantern plate, and fine in grain. If, however, this particular type of plate is unobtainable, the slowest that is available should be used. In any case, a plate not faster than that known as "landscape" or "ordinary" should be employed. Such plates have an H. and D. speed number of from 50 to 100. With any higher speed plate than this, the problem of obtaining a clean, black-and-white result becomes much more difficult. Above all, it is essential, if a perfectly clean black-and-white result is required, that the plate be properly backed; otherwise halation from the white paper will certainly blur and may even obliterate some of the finer black lines.

The illumination of the page or subject to be copied should receive careful attention. We need not again refer to the necessity for exact parallelism of the camera with the original when copying, and getting the copy square and absolutely sharp on the focussing screen. These points have been dealt with in previous articles. If daylight is available for illuminating the original, so much the better, provided the light is distributed evenly over the entire surface. Failing this, artificial light, which may be electric, gas, magnesium ribbon, or even oil lamps, may be employed. In this case, the lights (of which two should be used) are placed at the correct distance on each side of the original to cause equal illumination all over the surface, and in such a position that the light neither shines into the lens of the camera—reflectors behind the lights and a black paper hood round the lens will ensure this—nor is reflected from the surface of the original, which is very likely to occur if it is on glazed "art" paper. This latter point can be easily verified by peering at the original from as near the point of view of the lens as the eyes can be placed.

The question of exposure is one on which it is difficult to give definite advice, as the factors governing it will vary so much with each individual case, and may be from five minutes to half an hour or more, according to the speed of the plate, the stop used, and the intensity of the light. It is well, therefore, to make a series of trial exposures, wasting a plate in the process. This, however, will prove a good guide for future work under similar conditions. The plates should be exposed in sections by pushing in the shutter of the dark slide an inch or so at a time during the exposure, so that each section of the

plate obtains twice the exposure of the section preceding it.

The developer that is most favorably indicated for dealing with black-and-white work is hydroquinone. It is essential, however, to make use of this developer at its best, that it should be used at a temperature not lower than 60° F. Below this, it rapidly loses its developing power, and at a low temperature such as 35–40° F. it is practically inert.

A good one-solution formula for line work is:

Hydroquinone	50 gr.
Sodium sulphite cryst.	$\frac{3}{4}$ oz.
Sodium carbonate cryst.	$1\frac{1}{2}$ oz.
Potassium bromide	5 gr.
Water to	10 oz.

With a properly exposed slow plate, such as previously described, this developer will be found to give full density, at a temperature of 60° F., in about four minutes, and the plate should come from the developer with the edges, which have been protected by the rabbet of the dark slide, quite clear and white.

An alternative formula, and one that is frequently recommended for line work, is hydroquinone and formalin.

Hydroquinone	65 gr.
Sodium sulphite	3 oz.
Formalin	$1\frac{1}{2}$ dr.
Water to	10 oz.

This is a slower-acting developer than the one given above, but will produce even greater density combined with clear lines. After the plate has been fixed, it should, on examination over a brightly lit sheet of white paper, show the black lines of the original as practically clear glass; while the white base should be shown as strongly developed density.

A very slight veiling over the clear lines is generally negligible, but if absolute perfection in this respect is required, these lines can be readily cleared by passing the plate, after it has been fixed and rinsed, through a weak ferricyanide and hypo reducing bath. This will be quite sufficient to clear the lines without materially affecting the density of the other parts. When washed and dried, a negative produced in this way should be capable of giving clean black-and-white lantern slides (which can be developed and cleared, if necessary, in the same manner as that followed in making the negative), or prints, absolutely black and white in character, either by contact or enlargement, can be made on gaslight paper or slow bromide paper.—*Amateur Photographer.*

Notes for Double-transfer Carbon

WAXING solution for flexible temporary should be made of:

Beeswax	$1\frac{1}{2}$ oz.
Rosin (colophony)	$\frac{1}{2}$ oz.
Turpentine (rectified)	20 oz.
Benzole	10 oz.

The turpentine must be free from parafin oil, which is not the case when bought from a shop

selling both; the funnels often do duty for both fluids indiscriminately. The film left behind after waxing with the above sets more firmly and quickly than a solution compounded with turpentine only. Waxing solutions should be made up in no less bulk than above, the wax and rosin requiring time to dissolve and mix. Both flexible and rigid supports are ready an hour after being waxed with the above.

Rigid supports (opal glass, aluminum, or celluloid) after waxing should be albumenized. The following formula will be found very good:

Dried egg albumen	1 oz.
Bichromate of potash	$\frac{1}{4}$ oz.
Water	40 oz.

The albumen dissolves in a few hours, and will keep good for six months. Dried albumen is better than that from fresh eggs, giving a porous film to which the carbon image clings perfectly; fresh egg albumen gives a smooth film which is wanting in grip.

The albumen should be strained through two thicknesses of muslin into a deep porcelain dish (half-plate), applied to the waxed plate with a flat camel-hair brush, and the plate put on a rack to dry. The rack should stand in a dish to catch the drippings, which may be returned to the stock bottle. Some carbon printers dip the plates into the albumen, but that is very unsatisfactory; the solution soon gets dirty, the plates also get dirty backs, and air-bells are unavoidable on the surface, giving rise to spots of all kinds.

The film of albumen soon dries at the ordinary temperature of the workroom, and the plates are ready for use at once, or they may be stored for any length of time without any deterioration. The albumen film does not require any exposure to light to make it insoluble in a quite satisfactory manner. Rigid supports must be albumenized as above previous to each time of using as a temporary support, but do not require rewaxing except at long intervals, say, after being used twenty or thirty times, and if a good drying room is in use they can be used much longer without rewaxing.

Rigid supports of any kind will in time lose some of the matt surface, and yield prints more or less semi-matt, and new plates are not by any means quite perfect as regards surface. These faults can be counteracted by using moistened Carborundum powder (grade F) on a small glass muller with a face about one square inch (broken plate glass makes good nullers), which will speedily produce the desired surface.

The same muller and FF grade Carborundum will turn out very fine focussing screens.

The instructions given with each band, or packet, of double-transfer paper (final support) gives a definite temperature at which the coating is supposed to soften sufficiently for placing upon the image developed on the temporary support, but nowadays there are seldom two batches alike. With some paper the coating melts right off at 75° F., with others prolonged soaking at 150° will fail even to soften the coating.

When sensitizing carbon tissue for the color prints, and drying on a rigid support like plain

glass, polished celluloid will be found much more satisfactory: the tissue *never* sticks to celluloid, as it does so often to even the most carefully prepared glass.—*B. J.*

A Stunt Worth Knowing

IN photographing against the light it is quite important to shield the lens from light rays which do not form the picture image but which, because of their reflections on the lens surface, spread a veil of fog over the entire negative. Ordinary lens shades often answer the purpose, but for use in the studio the *B. J.* suggests a device which seems much more practical.

A black cardboard mask is placed in front of the lens instead of the card in the vignetter and the opening of the mask is made just large enough and is placed at just the proper distance from the lens to exclude all the rays of light except those which form the picture image.

The mask opening must be of the same proportions as the ground-glass image, and by moving the mask back and forth it is easy to see when it cuts out all the light except that which is necessary to form the picture. Such a mask will insure negatives free from the fog caused by lens reflections.

Milky Fixing-baths

PHOTOGRAPHERS sometimes have trouble, especially during the warm summer months, with their acid fixing-baths. Their baths become milky, and, as a result, they get brown or yellow spots, and sometimes a brown tone, over the whole surface of their prints. The trouble can be avoided by taking a few precautions.

Prints must be hardened in the fixing bath, and alum is the best hardener. Alum in combination with hypo will release sulphur; but acetic acid and pure sulphite of soda form a gas which prevents the releasing of sulphur and forms a perfectly balanced fixing-bath. If, however, the sulphite contains sulphate, sulphur will be released and the bath will become milky. The same is true of sulphite which has deteriorated through exposure to the air.

When you are sure that your sulphite contains no sulphate, there is still another precaution to take in mixing your acid fixing-bath. Be sure the hypo is thoroughly dissolved before you add the hardener. If any hypo remains undisolved, the addition of the hardener will release sulphur and make the bath milky.

A properly made fixing-bath should never be allowed to get very warm. Even with an unused bath, if it is made very warm, the gas formed by the acetic acid and sulphite of soda will partly escape and allow the sulphur to be released. The simplest and safest way to make up the bath is to have a stock solution of hardener, then, when the hypo is dissolved in the proper quantity of water, it is an easy matter to add the required amount of hardener.

Prints fixed in a milky acid fixing-bath really begin to take on a sulphur tone while fixing. This may not be noticed when the prints are taken from the bath, or while in the washing water, but all the same the toning process has begun and will continue even after the prints have been

laid out to dry, especially if the room is warm. The result is prints with brown or yellow spots, and sometimes a brown tone fairly even over the whole surface.

Keep a stock solution of hardener and mix fresh fixing-baths as needed. Do not add the hardener to the hypo until the hypo is thoroughly dissolved, and do not allow it to become warm after it has been mixed. These are all-important.

Of course, you all know that a fixing-bath should not be overworked. Prints will neither be properly fixed nor well hardened in a bath that has had most of the active chemicals worked out of it.—*Professional Photographer.*

Dry Plate Don'ts

DON'T immerse the plates in water before development; this is a common source of air-bells.

Don't forget to stir the developer in the tank before immersing the plate; this will prevent pinholes.

Don't expect water to develop a plate, especially when using a tank. It takes a definite quantity of chemicals to produce a good negative, therefore don't dilute the tank developer too much.

Don't forget to use an ample, but not too large, quantity of developer.

Don't practice false economy by trying to use pyro developer for a second batch of plates.

Don't allow the printing paper to get damp or it will result in stained negatives and prints of uneven color which will not tone properly.

Don't permit dishes, graduates, bottles or the work bench to become unclean.

Don't permit dust to settle on the plate; to remove it, grasp it by two edges and tap the edge gently on the table.

Don't become too economical with the fixing-bath; it is cheap, and plenty of it, used fresh, will yield clearer and cleaner results.

Don't dry the negatives where there is any chance of dust settling on them.

Don't lay the blame on the plates for unsatisfactory results until you have made certain that your manipulation is not at fault.

Don't forget to keep the developing tray in motion; this will prevent uneven development and produce a vigorous negative.

Don't use a dusting brush; it collects dust, which in turn is transferred to the plate.

Don't overlook rinsing plates thoroughly after development; because, if you don't, there is every likelihood you will find the negative stained and the fixing-bath discolored, and rendered less effective.

Don't forget to wipe your plate-holders, slides and camera frequently with a damp cloth.

Don't dry negatives in a room that is overheated; this causes melting of the film and increases the density.

Don't withdraw the negatives too quickly from the fixing-bath, or portions of the emulsion will be insufficiently fixed.

Don't allow the solutions to splash on the floor; because, when dry, the chemicals float about the air in minute particles and injure any plate they may fall on.—*Northern Photo. News*

Relief Photography

A PROCESS that would allow, in practice, of obtaining reliefs by means of photography, to the complete exclusion of the work of the art craftsman or modeller, would have a high importance. I shall give in a few words an idea of a new process of this kind which Prof. Namias, of Milan, describes in his latest book, entitled *La Fotografia in Rilievo*, and which is based upon the principle discovered a few decades ago by Poitevin, viz.: A bichromated gelatin coating will, after exposure to light, partly lose its swelling property when immersed in cold water. Thus, if we print a plate having a bichromated gelatin coating under a negative consisting of a scale ranging from black to white, we get in the space which was under the highest action of the light—after immersion in cold water—the least relief, while there will be a gradual increase up to the completely opaque strip which did not allow the light to pass.

Prof. Namias has thoroughly investigated the chemical and artistic conditions which allow the best results to be obtained, and his book gives full details.

The method is a relatively easy one if we only want reliefs from line subjects, but special difficulties have to be overcome if we wish to obtain a relief picture in continuous tone, completely modelled and corrected. We also must premise that in no case can considerable reliefs be obtained, although with the process worked out by Prof. Namias it will be possible to bring out reliefs of some millimeters in depth, while normally we can only obtain fractions of a millimeter. This will naturally limit the applications of the process, and only render it suitable for small work, as in this case even reliefs from one to two millimeters will yield a sensible effect.

If the subject of which we want to obtain a relief is a line subject (I shall not speak here about continuous tones) there will be no difficulty whatever in making a gelatin—and consequently a plaster—relief. We make a negative of great intensity with very transparent lines, and print on to the bichromated gelatin. After the swelling of the gelatin we get the design in intaglio, and on pouring in plaster we get the plaster relief.

It is only necessary to point out that the lines, instead of being flat on the top, like a zinc block, have their surface slightly curved.

This plaster relief now serves as model, which can be used direct as a mould or for obtaining the wax matrices for electrotyping.

In case of designs which represent simple ornamental subjects, it will be advisable to execute these designs directly upon transparent paper, saving thus the trouble of making the negative.

This gives an idea of the vast possibilities of application this process offers, especially in the field of small ornamental metal objects. Besides metal, any fusible material can be used; to mention only fusible enamels which will allow the reproduction of colored decorations in the ceramic industry which will yield a splendid effect.—R. BORN, in *Penrose's Annual*.

Useful Hints for the Line Operator and Etcher

As the war has caused great upsets in all professions, so is photo-engraving affected by the same. Prices of chemicals and material have tripled. Business is not going as usual, and great economy must be exercised to meet expenses.

Our photo-engravers are taxed to the utmost, and the one with the greatest knowledge of the profession is the one most liked.

Bromide, copper and silver solution, being the essentials used in wet-plate and collodion emulsion, have to be substituted by less expensive chemicals.

As all copies are not the best (such as are new drawings), newspaper cuttings or colored and old copies need "cutting" to get good clear negatives. Here is the formula I have used for some time and which gives good results:

Water	6 oz.
Bichloride of mercury	3 dr.
Hydrochloric acid	1 dr.
Sodium chloride	1 dr.
Potassium iodide	1 dr.

Expose, develop, and fix your negative, then soak in the above-mentioned mercury solution.

While your negative is soaking you can expose another, thus saving the time of intensifying the old way. When the second negative is fixed, the first will be ready for the next operation. Now if the negative shows any closed or misty lines, pour over it iodine and iodide solution, cut with cyanide and blacken with sulphide of sodium solution. You get the same results and save bromide and silver solution and time.—*Process Photographer*.

Packing Negatives for Shipment

FREQUENTLY photographs to be used in making halftone illustrations are made by photographers who make very good negatives, but who are not thoroughly familiar with the making of prints suitable for photo-engraving purposes. The prints they furnish sometimes lack important detail shown in the negative. This adds to the expense of the retouching in order to produce desired result. If there is any doubt about the print being suitable, it would be advisable to forward the negative to the photo-engraver.

When ordering negatives that you intend shipping, it would be well to instruct your photographer to use cut films to prevent the risk of breakage in transit. If you must ship glass, you can, by the observance of a few simple precautions, insure a greater degree of safety.

Always make a single compact unit of the glass. Do not place any kind of packing between the negatives, because packing that will give pressure at any point is liable to cause breakage instead of preventing it. Between the negatives lay a single sheet of paper or a clean blotter cut exactly to the size of the glass.

Place underneath and on top of the negatives a perfectly flat one-half inch board cut to the exact size of the negatives. Wrap very tightly with strong paper and tie firmly, or use gummed paper tape. If you use twine, see that the knots are at the edges, so that they cannot press on the

flat side of the package. This hard block can be packed in any wooden container with packing to keep it in position and should carry safely.

The negatives, tightly wrapped to prevent shifting, are placed between double-face corrugated board, an opening being cut in each sheet exactly the size of the negative block. These sheets are then cut to the exact size of the wooden box. Several loose sheets are placed in the top and bottom to form a cushion all around the glass. The container should be made of seven-eighth inch board to be free from the danger of other packages crushing during transit.

All packages should be labeled "glass" or "fragile," to insure care in transit and caution in opening.—*Gatchel's Booklet.*

The Process of Photo-Zincography

In the year 1859, Lieut.-General Sir Henry James discovered the art of photo-zincography. This art has since been employed with unequivocal success by Colonial and Foreign Governments. Photo-zincography has, in fact, progressed to a wonderful degree, and no firm undertaking reproduction work can be called up-to-date that has not adopted it. New processes and modifications have from time to time been discovered, and this wonderful method of reproduction appears now to be the most valuable method of its kind in existence. It is now over twenty years since I printed my first half-tone negative direct on to a zinc plate, and transfers were pulled from the same for litho-work.

Experience has taught me that the old formula, i.e.:

Albumen (fresh egg)	1 oz.
or dried albumen	70 gr.
Bichromate of ammonia	20 gr.
Water	8 oz.

is still the best sensitive solution for direct printing on zinc for photo-zincography. Litho-chalk ink answers well for inking up the plate after exposure, and is easily developed, with a tuft of cotton-wool. I prefer to deal with the cleaned printed plate as follows:

Gum up, fan dry, and, still leaving the gum on the plate, wash out the image with a "doctor," such as a saturated solution of turpentine—litho. crayon parings (or litho. writing ink), 1 oz. of bitumen or asphaltum to the pint. Next sprinkle water over the plate and wash off the gum; then re-charge the work with new printing ink. Washing-out over the gum prevents the work from spreading or thickening, and retains the finest lines clear and sharp, besides protecting the open spaces.

Penrose's process rubber comes in very handy for rubbing out any portions not required.

Gum Etch. The object of a gum etching solution is to fill up the pores of the metal plate with gum; and to prevent it receiving ink, while being charged. The gum etching solution should be of sufficient strength to only just mark the zinc, and must not visibly bite the plate.

The usual solution for this purpose generally contains tannic, gallic and phosphoric acids, in a solution of gum arabic. These chemicals, as well as others, have increased enormously in

price owing to the war; I have, therefore, altered my formula to the following:

Gum solution	1 pint
Hydrochloric acid	1 dr.
Nitric acid	1 dr.

After many months in constant use this has proved entirely satisfactory and equally as good as the old expensive formula. I can also recommend:

Chrome alum	$\frac{1}{2}$ oz.
Hot water	2½ pints
Gum solution	3 "
Hydrochloric acid	2 dr.

The gum solution in both cases is 1 lb. of gum arabic dissolved in five pints of water.—A. AUDY, in *Penrose's Annual*.

The Copying of Photographic Prints

WHEN called upon to copy a photographic print having considerable contrast, most photo-engravers have experienced difficulty in retaining the shadow detail, particularly if the print is of a non-actinic color, such as green or brown. If the difficulty is due only to the non-actinic color of the shadows, it is easy to make the copy by means of a color sensitive plate and an appropriate filter; for example, a Wratten panchromatic plate and a red filter in the case of brown or reddish prints, or a green filter in the case of greenish prints; but if, in addition to its color, the print has very bright high-lights and very dark shadows, it is impossible to retain the detail in the shadows when photographing in the usual manner, and some means must be devised by which the contrast can be lessened. Even if such a prolonged exposure is given that the detail in the high-lights is sacrificed, the shadow detail will still not be properly rendered, and such a prolonged exposure often serves only to make plainer the grain of the paper surface.

In order to reduce the contrast of such prints there is a simple expedient which has proved very successful, and this is to light the print partly by transmitted as well as by reflected light when photographing. This may be accomplished in various ways, but an easy method is to support the print between two clean sheets of glass and to place behind it a white reflector, so that the light from the lamps will fall both on the reflector and also on the surface of the print while the exposure is being made. By adjusting the distance of the reflector from the print, and the position of the lamps, the proportion of light coming through the print to that reflected must be controlled so that the detail required is just sufficiently photographed, since, if too much transmitted light is used, the texture of the paper is apt to be pronounced. To increase the light transmitted the paper can be rendered translucent with castor oil, but it is frequently not permissible to do this, and good results can be obtained without it, even with prints made on heavy weight paper, if the lighting be arranged so that a correct proportion of transmitted light is used.

No exact rule as to the proportion between the transmitted and reflected light can be given as this will depend upon the character of the original and on the nature of the lighting.—DR. C. E. K. MEES, in *Penrose's Annual*.

Keeping Chemicals

It might be thought that little can be said on the keeping in stock of the chemicals for photographic work. Yet the amateur photographer, and equally the professional or commercial worker employing much larger quantities, would save himself many difficulties by paying more regard than is commonly done to the storage of chemicals. The points most deserving of attention are different in the two cases. But I will endeavor to give some hints which I may hope will be deemed worthy of acting upon.

First of all, to the business photographer, I would give this piece of advice: If in any way possible, have a small room set aside for the storage and weighing out of chemicals. It may be the veriest cupboard, or only a space match-boarded off from some larger room so as to give a floor space of, say, 6 feet by 6 feet. Within such a small space as this a bench can be fitted with the scales and measures for the making up of solutions. Space below the bench allows for the storage of chemicals bought in bulk, such as hypo or sulphite, while the walls can be fitted with narrow shelving to carry the more expensive chemicals and the various odd preparations or solutions which are required, not for regular work, but once in a while, yet need to be somewhere where they can be quickly found. A little room of this kind keeps the main dark-room or other workroom from contamination by chemical dust when weighing out chemicals and making up solutions. It may not do so absolutely, but it goes a very long way indeed toward achieving this desirable end. In the experience of both amateur and professional workers spots and stains are at times a defect on prints and negatives, and often the only possible cause is the deposition in the workroom of chemical dust, such as is easily disseminated from light substances, such as the various developers. The amateur worker usually cannot permit himself the luxury of a separate chemical room, but usually he can use equivalent means of avoiding the use of the dark-room for the purpose. One requires to take a lesson from the manufacturer of dry-plates and papers, by whom the operations of mixing chemical solutions are religiously kept apart from those in which the sensitive material is freely exposed.

At the present time, when chemicals are so largely supplied bottled, there is not much occasion to say anything about the receptacles for the various substances. But it is worth while to advise the spending of a little money on proper corks for these bottles. The chemical merchant fits them with the cheapest cork obtainable, the shallow "shive," which has to be dug out of the bottle with some pointed tool, and requires a coating of some sort of wax over it to make a really air-tight seal. Once a bottle so corked has been opened it is practically impossible to use the same cork again and to

exclude the air effectively. Far better to lay in stock a decent supply of good corks. They cost "some" money, but they last as long as the bottles remain in use, and they save all the time and trouble requiring to be spent removing the "shives" whenever bottles have to be opened. Not at all a bad substitute are the wide-mouth bottles with metal screw stoppers, now used so largely for the sale of confectionery. If a disc of cork, or practically any soft material, is laid in the cap, screwing down of the latter produces a good sealing of the contents.

Such proper sealing is, of course, not necessary for all the chemicals used in photography. Hypo, for example, keeps quite satisfactorily even when freely exposed to the air, and crystallized carbonate of soda spoils only to the extent of losing some of its water of crystallization, becoming thereby stronger in quality. Crystals of soda show this change by becoming more or less opaque. It is just as well to keep soda excluded from the air, but very little harm is done if it is left freely exposed. But in the case of many other chemicals air has a spoiling effect in several ways. The chemical may absorb moisture from the air to an extent which in many cases may render it liquid, and therefore useless for practical purposes. Then air may affect such substances as sulphite by slowly oxidizing them; and, again, dust in the air may be the cause of deterioration of other chemicals, such as ferricyanide or permanganate. Practically speaking, the chief chemicals which require to be securely bottled as a preventive of their losing strength by absorption of moisture are carbonate of potash, sulphocyanide of ammonium, and the dry or anhydrous forms of soda carbonate and soda sulphite. This is about a complete list of chemicals which are in regular ordinary use. Perhaps I ought to add sulphide of soda, which also readily absorbs moisture. Caustic potash and caustic soda deteriorate to a double extent when exposed to the air—first, by absorbing moisture; and, secondly, by taking up carbon dioxide and thereby being converted, more or less, into the corresponding carbonate. Stick caustic alkali, particularly soda, quickly shows this change by white crust appearing on it.

Too often both commercial and amateur workers are neglectful in the matter of providing permanent labels for containers of chemicals. Where bottles are kept in a dark-room the moist atmosphere speedily loosens paper labels which are stuck on with ordinary paste. It is such an easy matter to make a label practically everlasting that it is well worth taking the job in hand and applying the process to every bottle in the place. A thin paper label is stuck on with ordinary gum or paste and the label gone over with a little size, such as thin glue, or solution of ordinary gelatin. As soon as this is dry (the next day) the labels are given a coating of carriage or "church" varnish, and when this is dry it affords an absolutely lasting protection for the label against damp, or even the more destructive atmosphere of a chemical laboratory.

One or two more points which perhaps may be fresh to some of my readers. It is a good plan, in the case of chemicals which are stored in considerable bulk, like hypo or soda carbonate, to

keep a measure along with the material, and thus to save the trouble of weighing out when making up a solution. The measure may be a cup or a glass, or may be made from a P. O. P. tube. It should measure the quantity usually used in making up a formula for fixing-bath or developer, or, if not the full quantity, then one-half or one-quarter of it. Mark it plainly "8 ozs. hypo" or "4 ozs. soda carbonate," as the case may be. For practical purposes such measures are quite accurate enough, so long as the degree of coarseness of the substance does not vary greatly. If one were getting soda carbonate in crystals of pea size, and then suddenly got in a consignment of the mixed form, containing both powder and large crystals like ordinary washing soda, it would obviously be necessary to discard the measure. The measure, in short, is useful and sufficiently accurate so long as the material measured is fairly fine and does not vary greatly in fineness.

The amateur worker, who buys chemicals in small quantities and very often requires to make up a solution in something of a hurry, may perhaps find it of service to keep certain chemicals in stock ready powdered. There are some few substances in the case of which it is useful to do this, for the crystals dissolve comparatively slowly. The chief of these are bichlorid of mercury, potass. metabisulphite, and potassium ferricyanide. Alum is another, but it can be bought in powder. If when you buy your stock you pound it up to a fairly coarse powder with a pestle and mortar, or with a hammer between clean brown paper, it will save you the annoyance of delay on the occasion when you may require quickly to make up some solution.—B. J.

The Iron Developer for Black and Sulphide-Toned Bromide Prints

IN the preparation of the stock solutions for the ferrous oxalate developer, it is necessary now to say something on the special character of this developer. Ferrous oxalate is totally unlike the organic developers such as metol or amidol. The real developing agent (ferrous oxalate) is a yellowish substance which is almost completely insoluble in water, but dissolves in solution of potass. oxalate. It is formed by mixing the two stock solutions of ferrous sulphate and potass. oxalate in such proportion that there is a considerable excess of the latter. The first practical lesson of these facts is that the iron solution should be added to that of the oxalate, not *vice versa*. It will be readily understood that if you add oxalate to the iron solution, you necessarily have at first a deficiency of oxalate instead of an excess, and that as a consequence some ferrous oxalate may be thrown down and render the mixture muddy. It is a general principle in chemical operations that it is far easier to keep a substance in solution than to dissolve it again when once it has been thrown down. Hence the rule of adding the green iron solution to the oxalate stock when mixing the developer. For the same reason the developer cannot be largely diluted with water in order to

render it slower in action. To do so weakens the concentration of the oxalate, with the result that the same kind of muddiness may be produced, if not in the solution itself, at any rate very probably in the substance of the prints. If the developer requires to be made up for slower action it is necessary to secure this result by using a larger proportion of the oxalate stock. A little experiment will show the user more than pages of writing. Take an ounce or two of ferrous sulphate solution, add a very little oxalate stock to it, and note the result.

For the same reason also the print must not be transferred from the developer to ordinary water. This will inevitably cause deposit of yellowish iron compound, which will be particularly noticeable in the white. The prints require to be passed direct from the developer into a weak acid bath, the effect of which is to keep the iron compounds in a soluble state and to allow of their being subsequently washed out before fixing the prints. On this point it is hardly necessary to say that the washing between the treatment with acid and the fixing of the prints is necessary in order to prevent acid being carried into the fixing-bath, since the presence there either of acid or iron is detrimental to the lasting quality of the prints and the purity of the whites. Thus it will be seen that the iron developer calls for several precautions which are altogether foreign to the use of an alkaline developer and entail additional operations. But if the different conditions are borne in mind there is nothing to prevent the prints possessing quality equal, if not superior, to that obtained with alkaline developers in every respect.

Coming now to the practical use of the developer, the working solution is made by adding one part of the ferrous sulphate solution to six parts of oxalate stock, forming a deep orange-colored mixture. It is customary to add a little potassium bromide, although an excess of bromide is to be avoided since it has the tendency to impair the fine black color given by the developer. From 5 to 10 drops of a 10 per cent. potass. bromide solution is an average dose for about 6 ounces of the working developer. It will be found that exposures require to be longer when the oxalate developer is used in comparison with M. Q. or amidol. Probably half as much again or, at the most, double exposure is as much as will ever be necessary; in many cases the additional time will be less than this. The print comes up fairly slowly in the developer—slowly, that is, in comparison with the hasty development largely adopted in the use of the alkaline developers, but with sufficient exposure development will generally be complete under four minutes.

Each print then requires to be transferred directly to the acid bath. This latter consists of a very weak solution of acetic acid, which, generally speaking, is the best acid for the purpose. Citric acid, which also was used years ago is a much more expensive bath. The strength of the acetic bath is 1 part of glacial acetic acid in 200 parts of water, or, roughly, 3 drams of the glacial acid in a Winchester of water. Quite likely present-day bromide papers will stand a stronger acid bath without giving

rise to any trouble in the way of frilling. If they can, all the better, since a stronger bath—say, one of 1 : 100—makes for more rapid and complete removal of the iron from the paper. A word may be said here on the glacial acid, which, if of full strength, will crystallize out in the bottle if the temperature falls much below 60° F. This simply shows that the acid is of proper strength; if the bottle be placed for a while in a warm place the contents will become completely fluid.

In working off prints in considerable number the best plan is to use a first acid bath in ample quantity—*e.g.*, an inch or two in depth and in as large a dish as can conveniently be employed. Here the prints can accumulate until the whole lot have been developed, after which they are transferred to a second acetic bath of the same strength and turned over in this for five or ten minutes. They then require to be washed in plain water for fifteen or twenty minutes before being fixed. While a fixing-bath of hypo only may be used, it is, we think, preferable to add also a fair dose of sulphite of soda for the purpose of taking up traces of acid which are carried into the bath in the prints and thus to supply a safeguard against an acid condition of the fixer. Where the fixer is made up with 3 or 4 ounces of hypo for every 20 ounces of water, half an ounce or one ounce of soda suiphite cryst. will be ample for this purpose.

Lastly, it cannot be too emphatically stated that cleanliness of dishes and fingers is of prime importance in the use of the ferrous oxalate developer. Traces of pyro and of other developers in contact with the iron developer give rise to intense dark stains, while ferrous oxalate is also a developer which is extremely susceptible to traces of hypo. The dishes in which development is done should be kept for that purpose alone, and in first taking up the use of the developer it is well to get entirely new dishes for the developing solution itself or to pick out those free from chips or cracks in the porcelain enamel and to make them chemically clean by rinsing with spirits of salt followed by ample washing in water.

In the use of ferrous oxalate it is quite possible that trouble may be met with in the form of blue spots and stains, if we continue the use of the popular bleacher of ferricyanide and bromide. While in theory the acetic acid baths used after the iron developer should remove all iron compounds, in practice they sometimes fail to do so, and though the small amount retained is of no consequence whatever to a black-toned print, it may be enough to give trouble if ferricyanide is applied. The same thing was a source of worry in the old days when uranium toning was in fashion, and the newer developers, such as amidol, received a warm welcome, because with ferrous oxalate one could never be quite certain as to results. Blue spots might appear, or they might not, and if they did the case was hopeless. There is no great difficulty in removing all the iron from a gelatin film, but in a print there is more paper than gelatin, and sometimes certain spots on the paper retain iron with an avidity that defies all the acid baths we can apply. If, therefore, we are obliged to use the iron developer

it is obviously safest to give up ferricyanide as a bleacher, or constituent of the bleaching bath.

Another matter for consideration, which unfortunately affects not only the ferricyanide-bromide bath, but also other useful bleachers, is the high price and growing scarcity of potassium bromide. With this salt at the present price of \$75 per lb., or its equally useful relation, ammonium bromide, at \$72,¹ economy is necessary. There is no adequate substitute for bromide in development, therefore we must keep a supply for that special purpose, and if the stock runs short we cannot afford to waste it unnecessarily on bleaching baths. Iodine is an excellent substitute for the bromide bleacher; its use is, of course, out of the question, both iodine and potassium iodide being required in enormous quantities for war purposes, and having already become almost unobtainable for any others. Obviously, then, for a bleacher we must fall back on a chloride one, and several of these are available.

The first chloride bleacher to consider is the one used for chromium intensification. This ordinarily consists of a mixture in equal parts of a 4 per cent. solution of potassium bichromate with a 2 per cent. solution of hydrochloric acid (that is, two parts of strong acid in 100 parts of water). For sulphide toning a little more acid is desirable, and we may as well keep each solution in 4 per cent. strength and mix equal parts of each when required. If the solutions are not to be kept a long time, we may keep the two mixed together, from the formula: One ounce each of potassium bichromate and of hydrochloric acid in water to make 50 ounces. But if toning is only an intermittent operation, so that the stock solutions may be required to keep for months, the two ingredients keep best separate. An alternative formula, recommended by Mr. Blake-Smith, is the following:

Potass. bichromate	90 gr.
Sulphuric acid	200 min.
Sodium chloride	1 oz.
Water to	10 oz.

After bleaching with either of these formulæ a good washing is desirable before sulphiding. The washing should be continued until all yellow stain has disappeared from the paper.

Another chloride formula strongly recommended by Mr. T. H. Greenall is the following:

A	
Hydrochloric acid, B. P., 31.8	
per cent.	3 oz.

Water to make	20 oz.
-------------------------	--------

B

Potass. permanganate	40 gr.
Water	20 oz.

To make the working solution, mix in order given: Water, 6 ounces; A, 1 ounce; B, 1 ounce.

¹ These are prices at time of writing; they may easily have altered before this article comes before the reader.

This bleacher will not keep in the mixed form, but the separate solutions keep almost indefinitely. It is probably the cheapest bleacher we can use, and though it will generally leave a certain amount of brown stain on the print, this will disappear in the sulphide bath. If it does not do so absolutely the following clearing bath applied after toning will put matters right: Oxalic acid, $\frac{1}{2}$ ounce; water, 50 ounces; with a few crystals of soda sulphite added. It may be noted that a very marked brown stain generally denotes either that the bleacher has been made up in the wrong order or that there is an excess of either A or B.

Here we come to a rather important point. For some reason that is not at all clear many workers fail to get good tones with any chloride process. The permanganate bath is, perhaps, the most reliable of those given, while the bichromate and hydrochloric acid bath often gives bad tones. We can, however, convert any of the chloride images produced into bromide images by simple immersion in a solution of potassium or ammonium bromide, of, say, 5 to 10 per cent. strength; and this is not a very extravagant proceeding, for such a bath will keep almost indefinitely. Mixed baths containing bromide do not keep so well. For example, a bath of ferricanide and bromide may become spoilt by the deterioration of the ferricyanide when the remainder of the bromide, very little of which is used up, has to be thrown away. On the other hand, the simple immersion of a well washed chloride print into a bath of plain bromide does no harm to the solution. A little is lost by absorption in the paper, but a very large number of prints can be treated without materially weakening the bromide contained in the solution; hence a 10 per cent. solution can be used so long as enough of it remains to cover the prints. A solution of an iodide can be used in the same way, but not to the same advantage, as solutions of iodide deteriorate rather rapidly.

We need not say much with regard to the sulphide bath, which can be just the same as ordinarily used. We may, however, point out that the most economical mode of use is to make the solution as required, by simply dropping a few crystals into a vessel of water. Workers on a large scale can safely make up a strong stock solution, of, say, 20 per cent. strength, if they can be sure of using it all up in a week or so, but, however strong the solution may be, its keeping properties are very uncertain after a limited time, and if things go wrong nothing can be done but throw the lot away. There is no real advantage in using a stock solution at all. A toning bath can be made up at any moment by adding a crystal or two to some water, and we need not wait for the whole to dissolve. In our experience a perfectly fresh bath like this can always be relied on to give a good tone.

Workers on a large scale will no doubt be well advised to adopt hypo-alum toning under the conditions we are considering. The use of this method after ferrous oxalate cannot lead to any special troubles, while the results will probably be more satisfactory from the beginning than those obtained with unfamiliar chloride bleachers. Neither is there any particularly valid reason

why the smaller workers should not adopt the same method, which is easier, more certain, and far less trouble than most people imagine. Once the bath is in good order the process becomes almost automatic. Another possible process is direct toning with liver of sulphur, but as so many workers apparently fail with this method we hesitate to recommend it farther than to say it is worth trial.

We may add that while there is not much experience available as to the effect of sulphide toning on ferrous oxalate developed images, the use of that developer having been practically abandoned before sulphide toning was introduced, there is not the smallest reason to expect inferior results. On the contrary, we should rather be inclined to anticipate that ferrous oxalate will give an image that is exceptionally well suited to the toning process. Ferrons oxalate was abandoned mainly for reasons of convenience, we might almost say laziness. There was never any question as to quality of result, and generally we may say that it is as good a developer as any in popular use today. It is not at all improbable that after a little experience it will once more become looked upon as one of the best developers.—B. J.

Bromide Toning Processes

Most photographer use bromide paper these days, and quite a large proportion of the prints made on this material are toned by one process or another. Now sometimes the toning process used is absolutely the best possible for the conditions under which it is to be used and the results desired, but quite often this is not so. Professionals are very apt to get into a grave and stick there, and whatever toning process was used first is usually carried on with, without much consideration as to whether it is the best for the purpose or not. It is the purport of this article to give brief notes on the principal processes, and indicate for what class of work each is best suited.

We will first take toning processes for the production of sepia tones. There are three main classes: (A) Hypo-alum, (B) bleach-and-sulphide toners in several forms, and (C) liver of sulphur, a little known but most efficient, toner.

Hypo-alum is the best toner of all for quantity production. It is, on the whole, better suited for large batches of cheap or medium class work than for really high-class prints, although with due care beautiful tones may be obtained. Taking it on the whole the tones given by this method are rather inclined to purple. It is almost always necessary to use a hardening bath for the prints to be treated. The toner must be used hot if it is to work in a reasonable time. It appears to reduce prints slightly, especially when newly mixed. It is apt to deposit a scum on the prints, which should be swabbed with cotton-wool, and any fault in the paper base is likely to cause blisters on the prints. These are all its faults, and many of these will not be found of any great disadvantage in practical work. The virtues of hypo-alum are many and great, chief among them being regularity

of tone, ease and speed with which large batches may be handled, and economy of cost. It is the cheapest of the sepia toners, and is the one most frequently used by trade printing houses. It should be mentioned that this is the one photographic solution which improves with use.

Our next group—bleach-and-sulphide—is rather complicated by the fact that many different formulae have been published for obtaining the same result. There is not a lot to choose between them as a rule. They fall under two main heads—bleach of potass. ferricyanide and potass. bromide, and bleach of permanganate, as brought forward by Mr. Greenall. I think the former is the better for general use, as it is more simple to use, but I believe that Mr. Greenall's method scores on the ground of cheapness. The usual formula gives potassium bromide in the bleacher, but it is an advantage both in cost and in the color of the resultant prints to use ammonium bromide in its place. Taking bleach-and-sulphide methods on the whole, the advantages are: Very fine tones, ease in working small or medium size batches, cleanliness of results, and the surety that the chemical action is complete, of which latter more later. The disadvantages are the liability of any impurity in the water to cause spots and markings, and the fact that small differences in the time of development of the prints make a big difference to the resultant color.

These are, to my mind, the best processes to use when a fair number of first quality prints are wanted. It should be noted that when these processes are contemplated amidol is the ideal developer, not only for the fine color it gives, but because it does not soften the emulsion of the prints as a developer containing an alkali must do, which is a great score in a process so liable to give blisters as sulphide toning.

There are many variations of these methods. One of the best is to place the print in the sulphide for a few moments before bleaching. They must be washed thoroughly before being proceeded with in the usual way; this gives very rich tones, but it is not easy to get big batches all the same color by this method. Or another useful dodge is to bleach in the usual way, and then darken in pyro developer. The color so obtained is rather a pleasing olive black. The bleached print may be partially darkened in any non-staining developer, and finished with sulphide. Quite a good range of warm blacks may be got in this way, but it is difficult to repeat them. Schlippe's salts may be used in place of sulphide for darkening, but it requires a really first-class original print. Then the tones are good and varied, but unfortunately variable.

The method suggested by Mr. H. W. Bennett, in which bichloride of mercury is used as the bleach, the darkening being done in sulphide, is a most interesting and useful one, but it can hardly be recommended as a commercial process because of the very deadly nature of the bichloride. It is a pity, because for warm black and deep browns the method is unbeatable.

Any sulphide-toned print may be further toned with gold—the usual P. O. P. formula; the results range from warm brown to red chalk.

They are most effective, and may be considered permanent.

Our last sepia process is, to my mind, the most beautiful of all, and it is certainly the least known. It is the liver-of-sulphur method. Its advantages are in the beautiful tones it gives, in the fact that it is a one-solution process, so that the change of color may be watched and stopped at the right time. It gives very fine tones on gas-light papers, which with ordinary methods tend to give yellow results. The disadvantages of liver of sulphur is the fact that it is not suited for large quantities. But I think it the ideal process for just a small number of really first-class results.

Now a word as to a most important matter—permanence. Leaving out of consideration the decomposition of the gelatin in which the image is formed, the only change likely to take place in the untoned print, providing it was well fixed and thoroughly washed, is the conversion of the silver image into one of silver sulphide, by exposure to an impure atmosphere. Now this is absolutely the same thing as sulphide toning, only the process may take years to show and never be completed. It is, therefore, obvious that a sulphide-toned print stands a better chance of remaining unchanged than an untoned one, and, further, that the more complete the change the better the chance of absolute permanence. It is here that the bleach processes score, because it is essential that both the bleaching and the darkening shall be thorough if a passable result is to be obtained. In the case of a single solution toner the action may be incomplete, and it may, therefore, continue under bad conditions. It will not cause fading, or even any very marked change in color, but it may be quite enough to make well matched spotting show up very badly.

On the whole, however, one may say that, so far as the image itself is concerned, a sulphide-toned print is unbeatable for permanence among silver images.

These are the processes most likely to find favor, but there are several other methods of toning which may be useful. Foremost among these is copper toning. This is a cheap and convenient toner for colors, from warm black to red chalk. It is used in one solution, so that the extent of toning may be observed and stopped at the right moment. The results of copper toning were at one time thought to be impermanent, but this must have been to a large extent due to careless methods of work. The prints should be at least as permanent as untoned prints.

The ordinary gold-toning bath, as used for P. O. P., may be used on untoned bromide prints, and will give a striking and not unpleasant blue-black effect, which may be found useful for special effects, especially strong lightings. The results are considered fairly permanent.

Uranium toning was at one time a very popular process, and at is still largely used in cheap studios for red chalk tones. It is, unfortunately, a most impermanent method, and its use is not to be recommended except for the cheapest work.

Green tones are best obtained by the use of Mr. H. E. Smith's formula, as given in the *B. J. Almanac*. This is not quite so simple to

make up or to use as some formulæ, but the results are fairly permanent, which is more than can be claimed for most green tones. In addition to this, the colors are quite pleasing.

The blue-toner given in the *Almanac* is also about the best for general use, the colors being really good. But, to my mind, when only an occasional print is to be treated, it is far better to buy the blue and green toners in tablet form. In this way the purchase of a number of uncommon and, for other purposes, useless chemicals is avoided, and the solutions may be prepared fresh with the least possible trouble. Of course, if a regular line is to be made of it, it is cheaper to mix your own.

In conclusion, may I suggest that to any photographer of an experimental turn of mind toners offer a wide and interesting field? They may be very profitable, too, for a unique tone is a wonderful "draw" for a studio. Experiments might be made not only in the way of combining known toners, but in the use of new reagents.—

ARTHUR G. WILLIS in *B. J.*

Photographic Materials and Processes

Papers; Measuring the gloss of photographic _____. K. Kieser. Z. angew. Chem., 1919, 32, 357—359.

THE method proposed is based upon the fact that the light reflected from non-metallic surfaces is plane-polarized in proportion to the degree of gloss of the reflecting surface. A suitable instrument is the Martens' polarization-photometer which constitutes the upper portion of the Schmidt and Hensch densimeter. If the two slits through which the light enters for the estimation of the density or degree of blackening be replaced by a single central opening, the Martens' photometer is converted into a polarimeter, resembling the old Cornu polarimeter. The rotation of the analyzer nicol is the measure of the polarization, and the percentage of polarized light in the total light is proportional to the tangent of the angle of rotation. The light must fall on the surface of the paper at an angle of 56° and the polarimeter must be directed toward the paper also at that angle; the line of demarcation of the two halves of the field of observation of the polarimeter will then lie in the same plane

as the incidence of the light. Complete polarization will correspond to a rotation of the analyzer through 45° . The best source of light is an electric incandescence lamp controlled by a variable resistance and provided with a depolarizing matt screen; a dark-room is unnecessary. Papers are always examined undeveloped, washed, and dried; it is very important that they should not be "fogged," since a slight grayness considerably increases the degree of polarization. A slight coloration does not interfere, but with pronounced colors values which are much too high are obtained and the two halves of the observation field are differently colored. Matt gelatin photographic papers give a value of about 10° , highly glazed ones about 30° , which is about the same as that of white enamelled glass. The method is capable of being used for the determination of the gloss of ordinary white papers which show values between 3° and 12° ; moreover, it is capable of showing much finer differences than can be detected by an experienced eye.

Colored motion pictures; Method and apparatus for producing _____. W. V. D. Kelley, Brooklyn, N. Y., Assignor to Prizma Inc. U. S. Pat. 1,322,794, 25.11.19. Appl., 12.7.15.

A PART of each of a series of motion pictures is obtained by open exposure, *i.e.*, without the interposition of the color-filter which is used for the rest of the picture.

Colored picture; Process and apparatus for production of a _____. J. H. Christensen, Sölleröd, Denmark. Ger. Pat. 313,836, 24.7.18. Int. Conv., 13.8.17.

IN a color process in which three color records are taken on one double-coated film and one single-coated film, the two films after completion of the partial color pictures being cemented together, *e.g.*, with glycerin, to form the complete picture, one or both of the coated films is stretched in a special holder in which it remains until the various processes and the cementing are completed. Where two such frames are used registration is secured by an arrangement of pins and sockets, and one (or both) of the frames is provided with a spring edge under the film, in order to assist in obtaining perfect contact of the two films.



HALOID—

Sepias that Satisfy

THERE can be no question as to the artistic worth of the portrait in *sepia*. The true sepia is indeed a thing of beauty—soft and alluring as a summer sunset.

Haloid processes have made the better sepias possible. Not only possible, but dependable and certain. The users of Haloid know, rather than hope, that their sepia prints will be all that they expect of them. They enjoy, in truth, genuine sepia-satisfaction.

Haloid Impera will give the warm, golden browns; Haloid Cameo, the widely liked neutral tints. Prints upon both will be sent on request.

THE HALOID COMPANY
ROCHESTER, NEW YORK

Chicago Office
68 W Washington Street

New York Office
225 Fifth Avenue

A HINT—
Haloid Fine Fabric Linen
(Buff or White)
justifies the highest expectations

WANTED Expert photographic retoucher to work on high-grade portrait negatives must also be first-class etcher. Give full particulars including experience and salary wanted. Underwood & Underwood, Inc., 1230 Connecticut Avenue, N. W., Washington, D. C.

Can You Add?

1 + 2 + 6 + ½ + 0 = Perfect Exposure

Sum of five figures gives perfect exposure. The simplest method of exposure calculation anywhere, any time, under any conditions. American Photographic Exposure Tables, Absolutely accurate, 90,000 sold. Cloth 35c, at dealers or American Photography, Boston, Mass. Sample copy of magazine, free.

HARVEY EXPOSURE METERS

No. 2 for Kodaks
Graflex and
All Cameras
Exterior or
Interior.
\$2.00

MP for
Motion Picture
Cameras
Exterior Work
Only.
\$2.00

Your Dealer or G. L. Harvey 105 So. Dearborn St. Chicago

SPL

Its that Luminous, Vibrating Quality that enables Pictorialists, Amateurs and Professionals to win prizes and honors by the use of

THE STRUSS PICTORIAL LENS

FREDERICK W. KEASBEY
Box 303, MORRISTOWN, N. J.

KALOGEN, a universal, concentrated liquid developer—just add water.

We can again fill
limited orders
for—

Seltona E.O.
COLLODION

The World's Finest
Photographic Paper

NO TONING NO DEVELOPING
PRINTS IN DAYLIGHT

J. L. LEWIS, 522 Sixth Avenue, New York
Agent

KODAKS CAMERAS LENSES

NEW or USED—MODELS and STYLES to suit the individual and purpose, at the lowest prices. Secure a copy of our free

BARGAIN CATALOGUE

and convince yourself of the extraordinary values we offer. If you have a perplexing problem to decide relative to this line, our force of experienced men will gladly render assistance.

First-class merchandise—moderate prices and prompt service guaranteed

CENTRAL CAMERA CO.

1224 South Wabash Ave.
Dept. F-31, Chicago, Ill.

STOP!! LOOK!! Our New No. 20 Bargain List which is now ready is better than ever. We buy and sell all kinds of Cameras and Lenses. Imported Ica and Butcher cameras. Headquarters for Cyko Paper. *Write today for Free Copy*

New York Camera Exchange, 104 Fulton St., N. Y.



"The Little Speedster" Gilbert Electric Retoucher

Speeds Up Retouching

Geo. G. Holloway says: "One of the best inventions that Photography has had the good fortune to meet with, most useful." Two Year Guarantee by Manufacturers.

GILBERT SUPPLY CO. Independence, Iowa
U. S.—DEALERS EVERYWHERE—CANADA

WILKINSON'S

PHOTO-ENGRAVING

IN LINE AND HALF-TONE

Photogravure; Photo-lithography in Line and Half-tone; Collotype and Heliotype and the Swelled Gelatine Method of Photo-engraving

ALL SIMPLY TAUGHT AND EXPLAINED

\$2.00, POSTPAID

EDWARD L. WILSON CO., Inc.
122 EAST 25th ST. NEW YORK

You Will Find It
in
"The Workroom"

How to Make a Studio Pay

There must be many photographers who would give a good deal for an hour's conference with some friendly and successful proprietor of an up-to-date studio: a man of ideas and "push-and-go."

Quite rightly they would expect to put their own businesses on a better footing as a profit-making concern.

Such an opportunity is actually offered in the manual "How to Make a Studio Pay," which is a practical talk by a successful photographer to his brethren.

His topics are such things as choosing a business location, buying and arranging stock, system in the studio, handling customers, knowing costs and profits, etc.

It is a book not only on "how to make a studio pay" but on how to make your studio pay better.

PRICE, \$1.50, CLOTH

Edward L. Wilson Company, Inc.

122 EAST 25TH STREET
Camera Building, New York

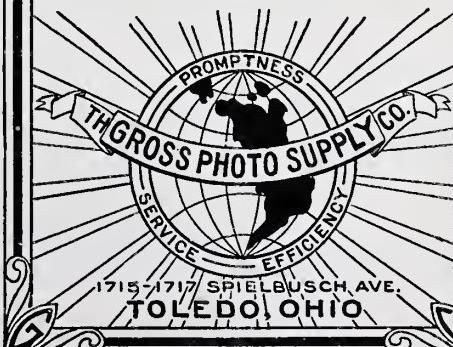
THE HOUSE THAT SHIPS PROMPTLY

GROSS

Many a photographer
Has thanked his stars
When he got
In a tight place
And needed mounts
The worst way
To keep him from
Having a bunch
Of rabid customers
On his neck
Asking him why
In the—you know—
He wasn't keeping
His promises
On deliveries,
When he remembered
He could send
A hurry call
To Gross of Toledo
And get SERVICE
And quit worrying
Because he knew
Gross Prompt Shipments
Would save the day.
We thank you!

(with apologies to K. C. B.)

**Are YOU a
Gross Customer?**



Hauff's Developers

Metol—Ortol—Amidol

Now obtainable in the old world-renowned pre-war quality

1 oz. bottle	-	-	-	-	-	-	\$2.00
$\frac{1}{4}$ lb. bottle	-	-	-	-	-	-	6.75
$\frac{1}{2}$ lb. bottle	-	-	-	-	-	-	13.00
1 lb. bottle	-	-	-	-	-	-	25.00

Specify Hauff's

Refuse All Substitutes

Sold by all first-class dealers

G. Gennert

American Distributors

New York

Chicago

Los Angeles



Photo by Stadler

Not made by daylight

This picture was taken by the light of Cooper Hewitt lamps. The quality of their light is the same as daylight and the supply is far more dependable.

Independence for the Photographer

A studio equipped with Cooper Hewitt lamps can make exposures at any hour of the day or night, regardless of natural light conditions. The light from Cooper Hewitt tubes is *always* exactly the same as the best north light so that, when exposures are once calculated, errors in timing are practically eliminated.

For enlarging and copying much time is saved by the use of this light and results are uniform.

Cooper Hewitt outfits are not too costly for the average studio and their maintenance expense is very low.

Literature will be supplied on request.

Cooper Hewitt Electric Company

Hoboken

New Jersey

General Offices:
95 River Street

BETTER THAN



DAYLIGHT

Works:
Eighth and Grand Sts.,

Boston—161 Summer Street
Chicago—215 Fisher Building
Cincinnati—First National Bank Bldg.
Cleveland—Engineers' Building

Detroit—Ford Building
Los Angeles—Kress Engineering Corp.
Milwaukee—Security Building

Philadelphia—Drexel Building
Pittsburgh—Westinghouse Building
St. Louis—Central National Bank Bldg.
Syracuse—University Building

When writing to advertisers kindly mention this Magazine

"A Manual full of good wholesome material and a valuable reference book for every member of the profession, big or little."

How to Make a Studio Pay

By Frank Farrington

With an Introduction by Ryland W. Phillips

"Mr. Farrington has placed in our hands a valuable book, every chapter of which is well worth our careful study. He has given us an analization of the business side of our daily work, he has attempted to show us not only 'how to make a studio pay,' but how to make OUR studio pay better. I say this because I believe there is not a photographic establishment in existence that has yet reaped its possibilities of profit taking."

—From Introduction by Mr. Phillips.

CONTENTS

The Man and the Location	How to Know the Profits
Buying and Arranging the Stock	Credit and Collections
System in the Studio	Developing the Side Lines
The Treatment of Customers	Advertising You Can Do
Business-Getting Schemes	

**Cloth Bound, 12mo., Price, \$1.50, Net, Postpaid
With subscription to PHOTOGRAPHIC JOURNAL OF AMERICA, \$3.00**

EDWARD L. WILSON CO., Inc.

PUBLISHERS

122 EAST 25th STREET

NEW YORK

A difference in temperature means a difference in quality.

Temperature has a direct bearing upon the chemical action of your developer and the correct temperature always produces the best result. Keep your solutions at the temperature recommended—*use a thermometer.*

THE EASTMAN THERMOMETER

Accurate, convenient—made with curved back, easily read degree marks, and with hook to suspend it in a tank.



Price
\$1.00

THERMOMETER STIRRING ROD

Combines a reliable thermometer with a handy stirring rod. The flat end is used for crushing the chemicals.

Price
\$1.00

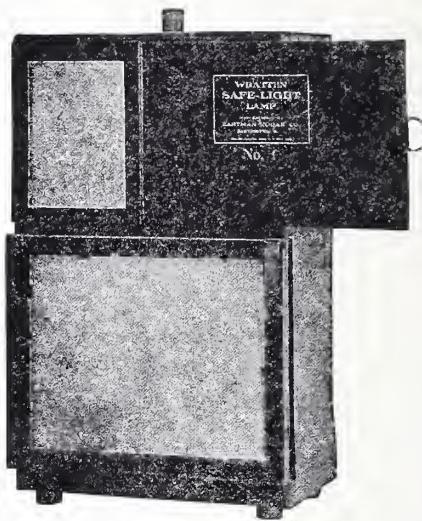
EASTMAN KODAK COMPANY,
ROCHESTER, N. Y.

All Dealers'.

Safeguard the quality of your negatives.

Wratten Safelight Lamps

Fog destroys the tone quality of your negatives and reduces their brilliancy. A safe light is your protection. Wratten Safelight Lamps are safe. The soft indirect light is a relief to the eyes, while the Safelight transmits the greatest amount of light that can be used with safety. Series 2 Safelight is furnished with lamps unless otherwise specified.



Wratten Safelight Lamp, No. 1, as above	\$10.00
Do., No. 2, without slide for white light	7.50
Series 1 Safelight, for plates not color sensitive, 8 x 10	1.25
Series 2 Safelight, for Orthochromatic film or plates, 8 x 10	1.25
Series 3 Safelight, for Panchromatic plates, 8 x 10	1.25



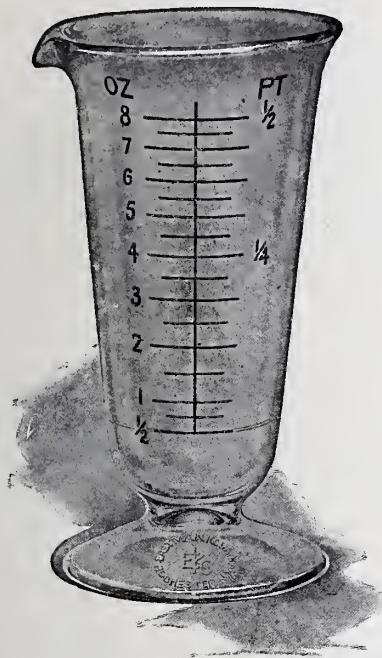
The Kodak Safelight Lamp

A smaller lamp embodying the principles of the Wratten Safelight Lamps. Constructed only for electricity and furnished with cord and plug but without electric globe. Series 2 Safelight furnished unless otherwise specified.

Kodak Safelight Lamp, complete as above	\$3.50
Extra Safelights, 5 x 7, any series, each75

EASTMAN KODAK COMPANY,
ROCHESTER, N. Y.

All Dealers'.



The measuring of liquids
is equally as important as
the weighing of chemicals.

Eastman Visible Graduates

enable you to measure
your solutions accurately
and easily. The markings may be plainly seen
even by the dim light of a dark-room lamp.

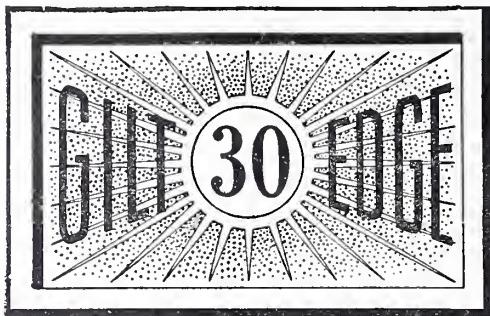
THE PRICE

Eastman Visible Graduate, 2 oz.	-	-	-	\$.25
Eastman Visible Graduate, 4 oz.	-	-	-	.35
Eastman Visible Graduate, 8 oz.	-	-	-	.50
Eastman Visible Graduate, 16 oz.	-	-	-	.75
Eastman Visible Graduate, 32 oz.	-	-	-	1.00

EASTMAN KODAK COMPANY,
ROCHESTER, N. Y.

All Dealers'.

SEED



PLATES

Speed for dull day exposures, latitude for variable light conditions, long graduation scale for correct reproduction of the tones of the subject, and fine grain necessary for enlarging—qualities that make Seed 30 Plates ideal for portraiture.

It's a Seed Plate you need.

EASTMAN KODAK COMPANY,
ROCHESTER, N. Y.

All Dealers'.

ELON

The genuine American Made
Monomethyl Paramidophenol
Sulphate.

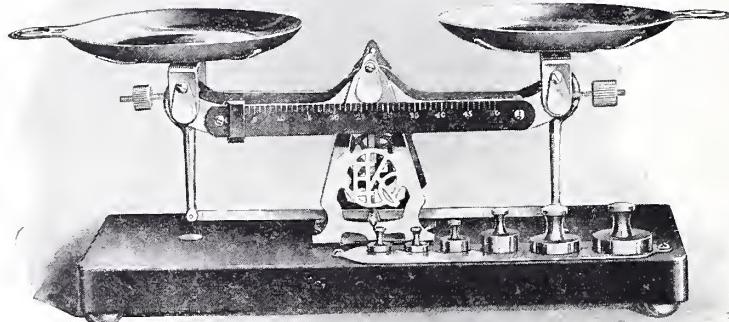
\$15.00 per pound

We make it—we know it's right.

Your dealer has it.

EASTMAN KODAK COMPANY
ROCHESTER, N. Y.

The Eastman Studio Scale (avoirdupois) was built with the idea of providing the professional photographer with a convenient, as well as an accurate, means of weighing chemicals. The small grain weights, so easily misplaced or lost, are replaced by a sliding weight on a beam, while carefully turned and tested larger weights fit into depressions in the base. It is convenient to use—it weighs accurately, and its hardened steel bearings make it exceptionally durable.

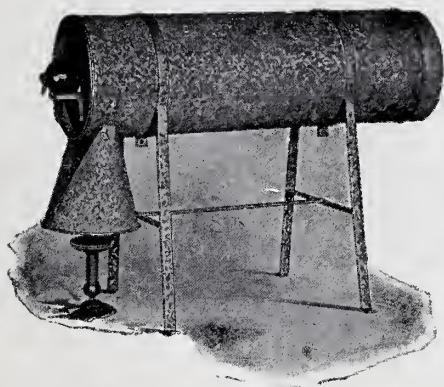


The Price \$4.50

EASTMAN KODAK COMPANY,
ROCHESTER, N. Y.

All Dealers'.

It's worth while to deliver your work promptly—use an



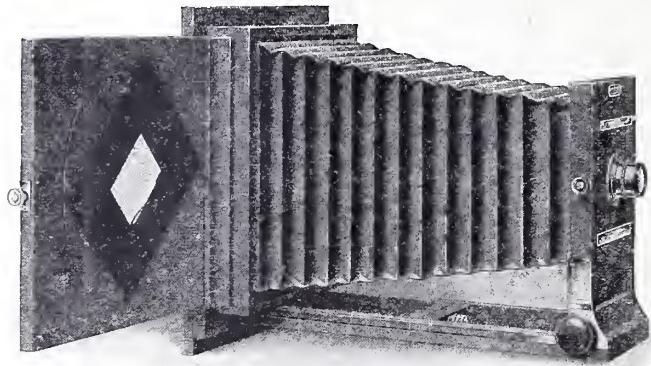
IMPROVED MAJESTIC PRINT DRYER

The Majestic shapes the prints properly and dries them thoroughly, as they should be dried, in from fifteen to twenty minutes—ample speed for turning out a big amount of work in a short time. The initial cost is small—the dryer is easy to operate—there is nothing to get out of order.

Improved Majestic Print Dryer No. 1, complete, with 2 drying rolls, electric motor, fan, gas heater and stand	\$35.00
No. 4, complete with 4 drying rolls	75.00
No. 5, complete with 5 drying rolls	80.00

EASTMAN KODAK COMPANY,
ROCHESTER, N. Y.

All Dealers.



The Revolving Back Enlarging Camera

For 8 x 10 and smaller negatives

THIS camera has adjustments that smooth out the little enlarging difficulties.

The light recommended is both rapid and economical because of its high actinic qualities and low current consumption.

The Revolving Back Enlarging Camera paves the way for better work and more of it.

All Dealers

Eastman Kodak Company

Folmer & Schwing Dept.

Rochester, N. Y.

Build on Quality

The best possible negative
for your printer on Film—
the best possible print for
your customer on

ARTURA

*The paper that reproduces
quality for quality.*



All Dealers'.

EASTMAN KODAK COMPANY,
ROCHESTER, N. Y.

You can't stop it!

Portrait Film was going in high
a year ago. The sales were al-
ready large.

Portrait Film Sales for
March, 1920,

were 185% in excess
of Portrait Film Sales for
March, 1919.

(Nearly three times as great!!)

No product ever made such
strides without a reason.

EASTMAN KODAK COMPANY,
ROCHESTER, N. Y.